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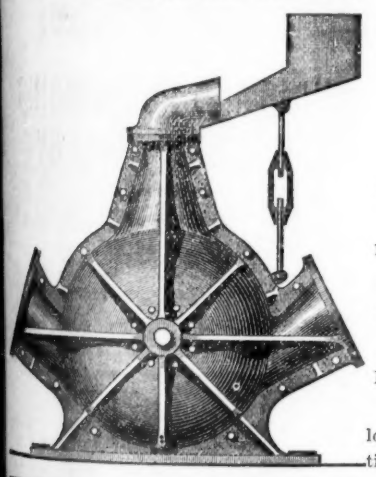

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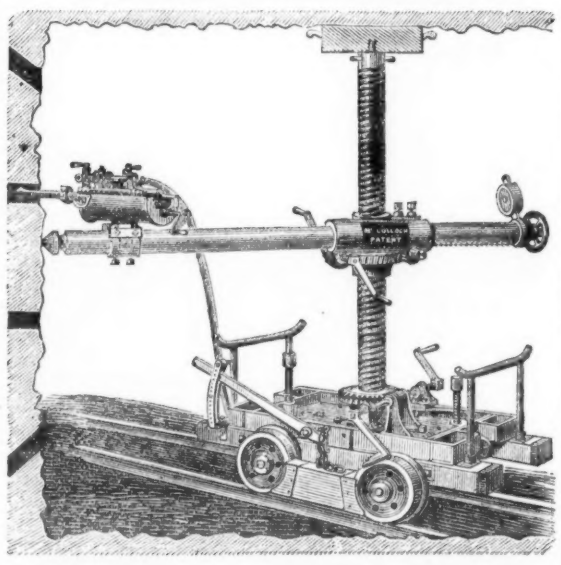

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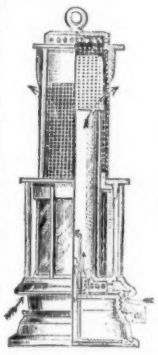

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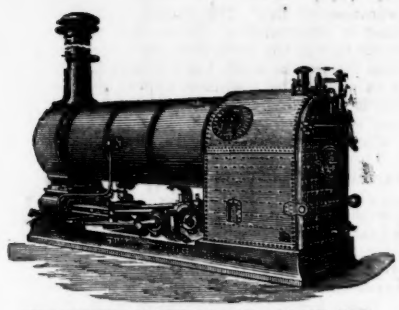

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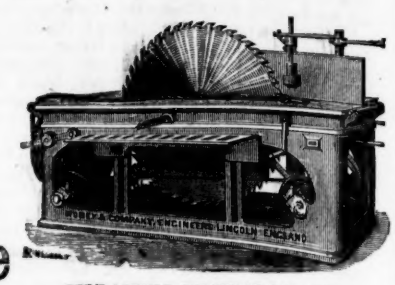

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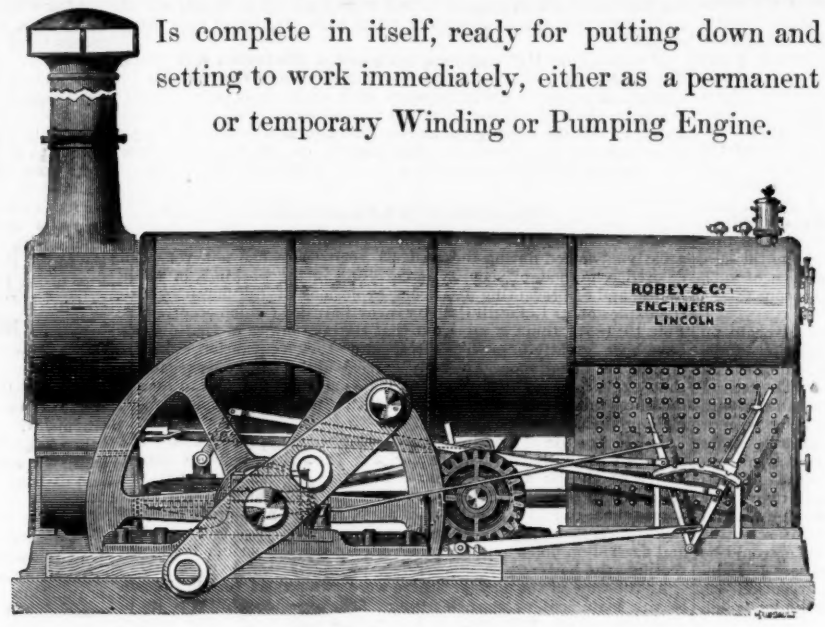

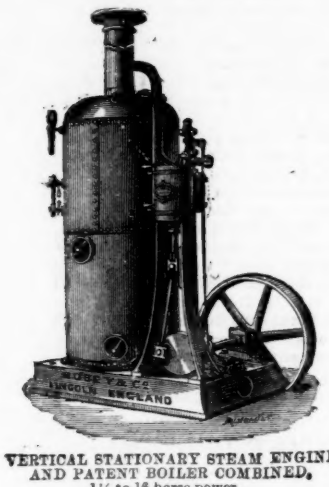

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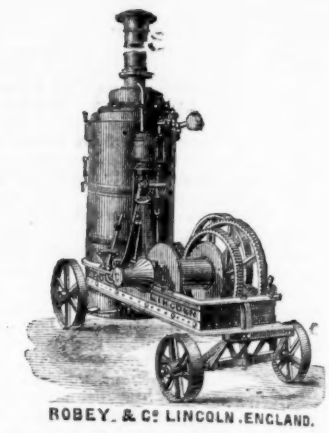

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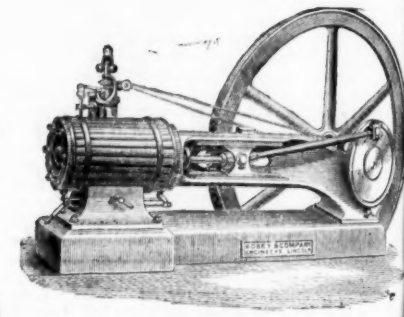

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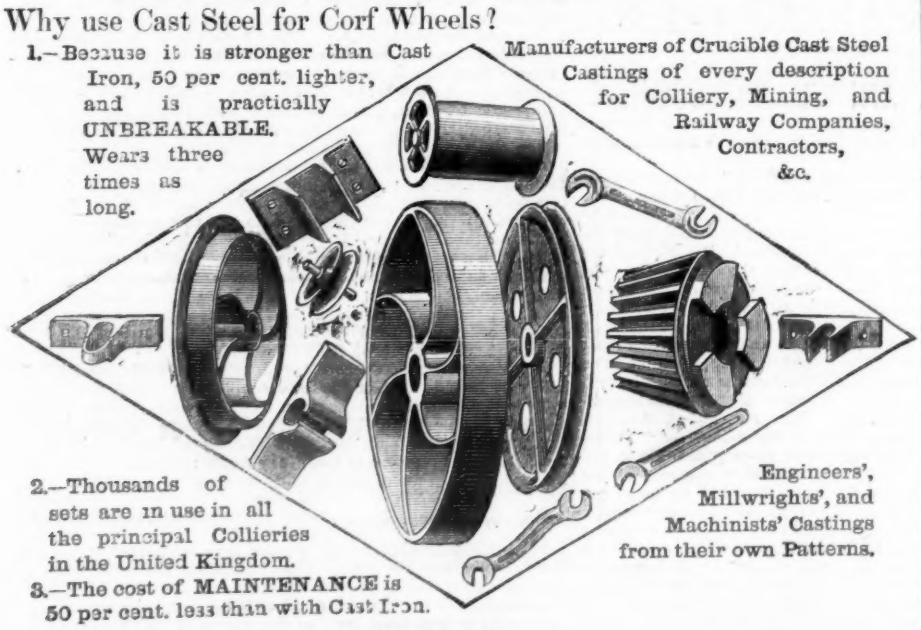

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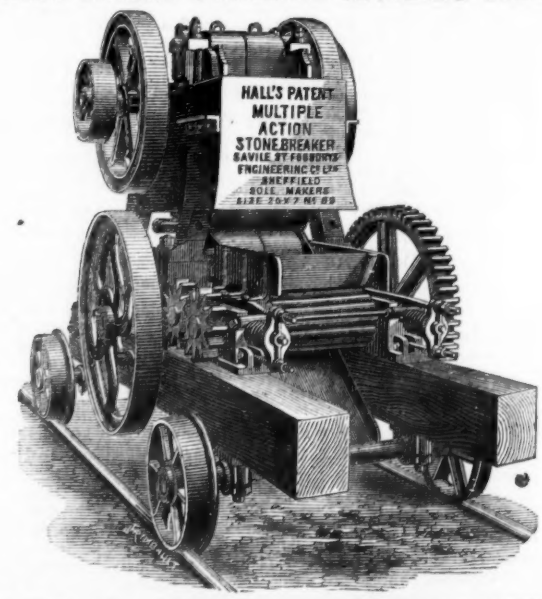

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Original Correspondence.

COLLIERY EXPLOSIONS.

Sir,—An interesting article on this subject and Mr. T. S. Fairley's letter on Ventilation of Coal Mines have been lately brought to my notice by a friend in this country. The subject is of vital importance, and you have forcibly illustrated the necessity for such an enquiry as I indicated in my letter published in the Supplement to the *Mining Journal* of Sept. 25. Mr. Fairley's letter, useful and true in many points, would no doubt have been very different had he, previous to writing, seen and considered my letter; but it is clear that his main object was to correct the statement in the article—namely, that in some parts of Germany, where a different system of ventilation to our own has long been in operation, colliery explosions are practically unknown. There was nothing in my letter to lead to this remark as to the Westphalian district, and I scarcely know any other district in Germany to which it would be fully applicable. What I chiefly sought to draw public attention to was the progress Germany is making towards ascentional ventilation, as contradistinguished from the system or practice of forcing the light explosive gases against Nature down hill. As I said in the letter referred to, I wish to draw the attention of engineers and practical men to the cardinal point of providing independent means from the highest points of the workings to the rise of a colliery, by ascending passages and a "wetter sohle" drift, for the rapid and uninterrupted escape of explosive gases, not only from the seams at work, but still more from the goafs and from old worked out seams which form, especially in the flat-lying seams of England, such dangerous magazines of gas. I did not mean to imply that the system in Germany is perfect or complete, far from it, as will be seen on reference to page 1121 of the Journal for Oct. 2, showing in this district in 16 years a loss of 476 lives by explosions. On the contrary, I advocated the enquiry as of "so much importance not only to Great Britain but to Germany, Belgium, France, and other coal producing countries;" and, in fact, the question is so momentous to the lives of all engaged in coal mines, and to the capital therein invested, that after due enquiry, as proposed, an International Congress should be held to redeem the age, if possible, from the stain which the frequent recurrence of such accidents, and our helplessness to afford immediate succour to the victims, entail upon engineering and science.

Mr. Fairley says in his letter, "It is very well to advocate an ascentional ventilation system. When the geological formation admits of it it is the correct method, but how can you introduce such a system when you have only flat-lying coal to work?" The answer is simple. There are several large collieries in Westphhalia with flat-lying coal of great extent worked on this principle, with a "wetter sohle," and I, at least, cannot bring to mind any case, either here or in England, in which any greater difficulty than that of expense exists to the adoption of the principle. I purposely avoided in my letter and will continue to abstain from putting forward any detailed plan of my own, my object being to promote an impartial open enquiry when the experience, talents, and energy of scientific and practical men, after full investigation and conference, would be freely excited to devise the best system for the purpose.—1. Independent of expense, but within range of practical execution.—2. Modified by retaining the expense within reasonable limits, which will make the plan worthy of adoption.

I contend that in this age of advanced civil and mechanical engineering, of the improved use of boring machinery, of cheap iron and steel, and of the use of electricity, not to speak of chemical progress, the means, the mechanical means to remedy the evil must exist and must be applied. In such a momentous matter it is to be hoped that all professional and international jealousies will be laid aside, and that mere general remarks relative to the difference between the local circumstances of different coal districts as have been used by correspondents in animadverting, however kindly, on my letter will not weigh with the public, and those whose lives or property are at stake, in averting their attention from the means necessary to prevent to the greatest possible extent such explosions in future. This was the main object of my first letter; it appears to be the great object of the Secretary of State for the Home Department after the sad occurrence at Seaham; and however willing I may be to answer, to my own satisfaction at least, the questions and assertions raised by anonymous correspondents or others on side issues I must resist the temptation to do so for the present in order to avoid all possibility of prejudicing the solution of the main proposition—developing the means for the prevention, or at least the great reduction, of colliery explosions and their consequent evil. Wm. T. Mulvany.

Pempelfort, Düsseldorf, Oct. 4.

COLLIERY EXPLOSIONS.

Sir,—In last week's Journal is an article referring to Mr. Mulvany, of Düsseldorf, and pointing out that in the Dortmund district the loss of life from explosions of gas in their coal mines for 16 years last past amounts to only 476, although the district produces at present over 20,000,000 tons per annum. Perhaps you will find room for the following figures, showing the loss of life from this cause in South Durham during the same period.

Tons of coal produced and lives lost by explosions of fire-damp in South Durham district during 16 years to 1879:—

	Tons.	Lives lost.
1864	13,835,544	3
1865	14,181,433	4
1866	14,930,000	28
1867	15,442,000	1
1868	15,300,000	1
1869	15,636,000	2
1870	16,800,000	None
1871	17,946,000	27
1872	17,395,000	None
1873	17,436,045	1
1874	17,911,246	2
1875	19,452,664	1
1876	19,511,036	5
1877	19,546,292	1
1878	18,612,246	4
1879	17,146,644	None
Total	271,082,150	80

Average per year—Durham district, 16,942,634 tons; 5 lives lost.
Dortmund „ 20,000,000 „ 29·75 „

I have chosen Durham district because it is nearly of the same extent; because it is known to contain fiery seams; and because it is usually considered to be managed by capable men; and I think the figures given clearly show that our engineers have not much to learn from the Germans, so far as ventilating of coal mines is concerned at all events.—*Oct. 6.* H. B.

EXPLOSIONS IN COAL MINES.

Sir,—To judge from the statistics of accidents in coal mines, the period of the year is approaching when explosions of gas are the most frequent, and, therefore, a word on the subject may not be untimely.

I state without much fear of contradiction that accidents from explosions of gas do not arise so much from variation in the pressure of the atmosphere as from other and controllable causes. It is an undoubted fact that as winter approaches, and the consequent consumption of coal increases, the stocks of the proprietors of house-fire collieries become lessened, and steps are taken to increase the output of mines to supply the demand, and in some cases resort is had to what is called working double and sometimes three shifts—*i.e.*, a relay of workmen are waiting at the conclusion of the day's work of one set of men to take their places and continue the operations, so that no time may be lost; from these circumstances, in my opinion, all the danger arises. For instance, in a colliery which is being worked in the manner described the men who have just left the place after their eight-hours shift have exposed a fresh face of coal, which alone will give off a certain extra quantity of inflammable gas per minute. They may also have tapped several small blowers or pockets of gas in the sides, roof, or floor of the seam; and before these blowers have had time to exhaust themselves, and before the ventilation had had time to dilute and render harmless this noxious gas, a fresh set of men, who are unaware of the state of the place, commence work as the others leave off, and so on through the twenty-four hours, perhaps for a week through, and this state of things may exist in every working place in the mine until the air becomes so charged with gas that it may be approaching an explosive mixture; it only remains, then, especially in a dry dusty seam, for the flame from a blown-out or overcharged shot to come in contact with this supercharged air and the body of dust stirred up by the shot, and a fearfully disastrous explosion takes place, wrecking the workings of the colliery, and spreading death and desolation into numbers of happy homes and families.

It is not unreasonable to suppose that if eight hours were allowed to elapse between each shift of workmen many such explosions would be avoided, as that interval would not only allow the fresh air to regain its ascendancy and purify and cool the working places, but it would also afford a sufficient time for the ventilating apparatus and arrangements to be examined and restored where found necessary and deficient, as it is very often the case that in the course of the operations they may have become deranged. This derangement of bratticing and other appliances, caused perhaps by a shot immediately before the previous lot of workmen have left the pit, and which their successors have not time to replace, is no doubt the cause of many of the explosions which have from time to time proved so disastrous. I could point out recent explosions which have originated from these causes.

If some of our M.P.'s who are interested in this matter would take the subject up, and bring forward an Act to enforce the cessation of operations for eight hours between each shift, especially in those mines in which it is found necessary to use locked safety-lamps, they would receive the blessings of an immense mining population. I hope these remarks may prove of some benefit, even if they only draw attention to this important subject. A Mining Engineer.

COLLIERY EXPLOSIONS.

Sir,—Although the ventilation of coal mines as a system has been greatly advanced during the past 23 years there has not yet been devised a method of security in carrying on the workings of those mines, and of preventing disastrous explosions of fire-damp. Since the explosion at Lundhill Colliery, near Barnsley (which occurred on Feb. 19, 1857), there is no doubt that the coal mines in that district have been greatly improved in respect of their ventilation, and the operations being more carefully carried out. The consequence is that explosions are less frequent, showing that the precautionary measures taken, though concurrent with an increasing output of coal, have produced good results.

The loss of life at Lundhill was at that time unprecedented—189 persons were killed by the explosion. The writer believes that a review of the circumstances attending this explosion—that is, the condition of the mine before and after the accident, and the measures taken to prevent such accidents in future—may prove to be of service to persons engaged in mining. Where mines are being worked and carried on under a dangerous system then the sooner faults are rectified the better.

At the time of the accident there were two pits at Lundhill down to the main coal or Barnsley seam. The downcast pit 11½ ft. in diameter; depth, 213 yds. 2 ft. 4 in. to the main coal. The upcast, 33 yards distant from the other, and on the rise side of it was 9½ ft. in diameter. At the bottom of this pit a furnace was placed, 8½ ft. in width, distant 14 ft. from the lip of the pit.

The section of the main coal on the north side of the pits, in No. 4 bank, was as follows:—

Top soft coal	0 ft. 6 in.
Middle coal	1 0
Low soft coal	1 6
Clay seam	0 6
Hard coal	2 0
Bottom soft coal	2 ft. 2 in. = 7 ft. 8 in.

The coal rises 3 in. in a yard, and was free from faults. The area of the workings—both bord-gates and banks—was not extensive, being within the limits of 52 acres. The method of working this seam was by the system of bord-gates and banks or wide work between them. In the first place, three main places were driven on the level course, both north and south of the pits; the lowest, or that most to the dip, was used as the intake for air and the hauling of coal; the middle level was the main return; the upper one was called the bank level, from which the banks were usually commenced. The bord-gates or narrow bords were driven in pairs to the rise, the average distance apart (centre to centre) about 110 yards, or a clear space between them of about 92 yards. In these spaces the banks were commenced from the upper level, being kept behind the face of the bord-gates 70 to 90 yards, and sometimes more. The first or leading bank is driven 20 yards in width, and on each side of this following-up banks are driven, each 6 yards in width, one in advance of the other about 30 yards. The coal is brought to the bord-gates through narrow openings called slits, which are about 44 yards apart. The bank with the following banks finally becomes 56 yards in width, which would leave a pillar of coal 18 yards in thickness adjoining each pair of bord-gates. Each bank would thus become eventually a large goaf, with workmen engaged about it, not only at the top but also at the sides, at six different points. The bord-gates, as observed, are driven from 70 to 90 yards in advance of the banks. They thus serve the purposes of draining the coal of gas, also as air roads to the banks, and for the transit of coal from the working places to the pit.

For the ventilation of the mine about 55,000 cubic feet of air per minute passed through the downcast pit; this was divided at the bottom, about one-half going north and the other going south into the workings. The air on the north side went to the end of the horse level, thence up and down the furthest bord-gates, through the highest slit into the No. 4 bank, up the side of the bank to the face, across the face, down the south side of the bank, through the slit on that side to No. 2 north bord-gates. The air passed up and down No. 2 bord-gates, and so on to the No. 3 bank in a similar manner. A portion of the air was intended to scale by the sides of each bank down to the bottom, and thus ventilate the following-up banks. The south side of the pit was ventilated in a similar manner to the north side, the two returns meeting in No. 1 south bord-gate, and so passing over the furnace to the upcast pit. The great objection to this system of ventilation was in the number of doors required. At the bottom of each bord-gate a door was placed to carry the air to the extremity; a door was also placed at every slit on one side of the bord-gates. All of these were single doors, attended by boys, not being protected by another door and canvas sheet, as now usually done. There were 53 doors in all, a great many of them requiring attendants. It was the custom for the attendants to leave the doors at meal times, thus adding to the great risk of the arrangement. Then, again, the use of open or closed lamps was at the discretion of workmen. If no danger was apparent they used the lamps without the gauze covering. Many were found in this state after the explosion, and were often so used by packers as well as those working coal.

It was stated that no disaster was apprehended on the morning of the explosion; no gas had been seen in any part of the mine. The points where gas was most frequently seen were at the face of the bord-gates, but not in large quantity—the air being sufficient to dilute and carry it off. Gas had occasionally been seen at the face of the banks. The writer is disposed to believe that little, if any, gas would be found in the goafs below the banks. On account of the seam rising 3 in. in a yard any gas evolved would rise naturally to the face of the bank, where it would be carried off by the current of air continually passing. Three theories have been advanced as probable causes of this explosion—the first that a fall of stone may have forced out gas from one of the goafs near the upcast pit, and that this in mixture with the return air fired at the furnace. The nearest point of these goafs to the furnace is not more than 80 yards. The late Mr. N. Wood wrote a paper on the subject of this explosion. He held that the explosion originated from a fall of stone in No. 2 or No. 3 north goaf, forcing gas upon the open lights used at the sides or following-up banks of these goafs. The third conjecture was that a door had been left open, and an accumulation of gas took place, which was ignited at the first light it came in contact with. The accident occurred about 12·30 in the day—a time when the doors were not attended to. The appearances of fire were most seen at the bord-gates right above the furnace, and at No. 1, No. 2, and No. 3 north bord-gates the bodies appear to have been more or less burnt in those parts. From the direction in which the doors and stoppings were thrown the force of the blast had gone southward. On the south side of the pits there were little or no appearances of fire. The bodies apparently were not burnt, but the blast or concussion of the air had gone in with terrible force against the face of the south levels and the bord-gates. This was apparent from the way in which the rails and sleepers were torn up and the rails twisted. The workmen appear to have been struck down and killed in the places where they were working. The reaction of the air had sometimes thrown doors and stoppings in a contrary direction. When we consider the great explosive force of a mixture composed of 9 parts of air to 1 of carburetted hydrogen—that it is found by experiment 10 cubic feet of this mixture would lift 463,000 lbs. 1 ft. high, or lift a weight of 3 tons about 70 ft. high—it is apparent that with a suspension of the ventilating current in a mine such as this a quantity of gas would in a short time be evolved sufficient to account for an explosion so destructive in its effects as that described, the area of workings not being extensive, and so as to allow of its free expansion.

After the explosion it was found that the cages in the pit could not be used; a bucket was attached to one of the ropes, and by this means three men descended the downcast pit two hours after the explosion: 14 or 15 workmen were at the bottom calling to get to bank, which was done—the other workmen in the pit, it is believed, were then all dead. Several more explorers descended the pit; a fire was seen raging at the furnace and in the stables—this increased so rapidly that at 7·40 P.M. of the same day it was extremely dangerous to be in the pit, and all the explorers came out. The flames were then rising about 100 ft. high above the cupola top. It was decided to close the top of the downcast pit, so as to exclude the current of air; afterwards the upcast pit was closed, with the exception of a small aperture. It was found that a current of air and smoke with carbonic acid gas still came up the upcast, showing that the top of the downcast was not air-tight. The effect of closing the tops of the pits was to subdue the flame; but as there would be a mass of burning material, which would cool very slowly, and would probably kindle into flame if the shafts were again opened, it was decided on Feb. 25 that water should be poured into the downcast pit. Accordingly this was done until March 24, when the depth of water in the upcast pit was 60 feet. Immediately after this the raising of the water by tanks was commenced and continued to April 17, when the mine was re-entered, and the fire found to be extinguished. Two fans were put up in readiness—one 5 ft. 9 in., the other 5 ft. 10 in. diameter, which with a waterfall were sufficient to cause a ventilation of 23,540 cubic feet per minute, and to open out and explore the mine. Engineer.

GUNPOWDER IN COAL MINES.

Sir,—The use of gunpowder in coal mines has been, and is, the fruitful source of so many and fatal accidents that its compulsory discontinuance amounts almost to an imperious necessity. But the prohibition of the use of explosives would render the working of many of our coal mines so unremunerative that it would be impossible to keep them open, the pits would have to be closed and the hands discharged, the supply of coal would be lessened, the price would be increased, and our great iron and cotton industries would suffer to an extent disagreeable to contemplate.

These were some of the reasons which led the Home Secretary to reply to a deputation which waited on him on this subject that he could not recommend the compulsory discontinuance of the use of gunpowder in coal mines, but that he hoped next session to be able to submit a plan by which the danger of its use could be got rid of. To many of your readers this hope of Sir William Harcourt's will appear as a Utopian idea; nevertheless, it is a fact that in some of the fiery pits in the neighbourhood of Barnsley a system of blasting is performed where water is used in addition to gunpowder, with the best possible results.

The system is simple in the extreme, and, so far from its being costly, it is an economy; for, in the blasting operations performed with water in conjunction with gunpowder, a greater amount of work is done with considerably less powder, and the powder is rendered harmless. The value of the foregoing will be best appreciated by a short description of the operation.

Ordinarily, blasting with gunpowder is done somewhat as follows:—A bore-hole is made in the face of the coal about 2 in. in diameter and 4 ft. or 5 ft. deep. Into this hole a powder cartridge is inserted with a slow fuse attached; the hole is then tamped—that is to say, it is filled with any available dry refuse rammed in tight; the fuse is lit, and the cartridge fired. In this operation a flame, very dangerous in fiery pits, is created, and carbonic acid and sulphurous acid gases and smoke are generated.

Blasting with water and gunpowder is performed in the following manner:—Into the bore-hole is inserted a powder cartridge, with fuse attached; next to the powder cartridge is inserted into the bore-hole a tube containing water. These tubes should be as large as the bore-hole will admit, and of any convenient length; the longer the better. They may be made of any convenient cheap material, thin tin-plate, or of stout brown paper turned round on a wooden roller and pasted together, the ends closed with corks; the bore-hole is then tamped, the fuse lit, and the cartridge fired in the usual manner.

The result of this operation may be briefly summed up. The powder, in exploding, bursts the tube containing the water; the rending force of the powder is extended through the water by the well-known principles of hydraulics, demonstrated years ago by Bramah over the enlarged interior area of the bore-hole, due to the space occupied by the water tube. A much larger quantity of coal is thereby brought down with a smaller quantity of powder; the heat given off by the burning of the powder and the gases converts a portion of the water into steam, the elastic force of which assists in the operation of blasting; the steam and water together put out the flame and flash of the powder, and absorb and neutralise the greater portion of the gases and smoke resulting from the explosion.

It will readily be seen that herein are met together economy and safety by the adoption of a system simple as it is effective, and it is to be hoped that, in the best interests of humanity, our large and intelligent coalowners will not be slow to adopt an amelioration in their present crude and dangerous practice of blasting, which will tend in a great measure to make explosions in coal mines a thing of the past, rather than of almost daily occurrence. F. A., C.E.

COLONEL SHAKESPEAR ON COLLIERY VENTILATION.

Sir,—Air and water follow similar laws of nature in regard to their motion, but the action of a river being the most visible it is the best suited for illustration. When running through a straight pipe the flow of water is impeded only by friction against its sides; but in a bent tube there are also the curves to be overcome, which check speed, and should there be bulbs in the pipe, or should the water run direct through a cistern, both would contain water practically stagnant. The river runs towards the sea from being dragged by the force of gravity to a lower level—*i.e.*, a water vacuum. The water travels the line of least resistance, running quickest about the middle of the stream, slackening towards the sides, till there is no motion in pools or inlets along the edges.

Compare a current of ventilation by fan or furnace with what has just been written, and the same laws become apparent. The vacuum which the fan or furnace is ever striving to create in the upcast shaft is replenished by air travelling lines of least resistance, and avoiding the inlets, such as goafs, wastes, holes, hollows, &c., thus leaving the air or gas in them as stagnant as the water in the side pools. It is true that doors and bratticing are used to direct currents, and especially the latter, into working places and others, where ventilation is very sluggish, but in order to get air into such places an excessive quantity of it is required to be at a high velocity in the main airways, to the great danger of an explosion on the sudden outburst of a blower. Let me here remark on the common practice of drawing one's chair aside of a line between an open window and door, to avoid

the draught, and also bear in mind that a smell may hang about the corners of a room, notwithstanding a draught through the room, just as a running river may not affect the inlets. This fact goes to prove how very local air remains unless it is disturbed. No doubt, air and gases follow the law of diffusion, but that is too slow in its operations to be considered in mining ventilation.

Having explained this much, I had best apply it to practical coal mining by asking a question. Is it not the case that a current of ventilation in a coal mine, produced by the suction of fan or furnace, travels the lines of least resistance from the downcast to the upcast shaft, and that the air does not, and cannot, penetrate to the goafs, holes, and corners? Of my own knowledge, it does not, except occasionally, when a special effort is made to force it. But the non-penetrating power of an air current of ventilation produced by suction is by no means its only failing. We know that every variation of the barometer corresponds to 7 lbs. on the square foot for every 1-10 in. rise or fall, and also that a fall of, say, a little more than 3-10 in., may take place in a few hours, thus lightening the atmospheric pressure 1 lb. on about every 6 square inches, which in itself favours the escape of gas from the strata and the formation of fire-damp.

When such circumstances arise, as they frequently do, the orders are to increase the suction of the upcast shaft. More revolutions of the fan, or fire-up the furnaces, are the orders given for safety, but which really add to the risk. Believing such orders to be a mistake, I should be inclined to do as Nelson did at the battle of Copenhagen, who put his telescope to his blind eye that he should not see the signals and disobey them; indeed, I would slacken both engine and firing instead of increasing their power.

Now, I will continue my illustration. A flowing tide comes up from pressure, and penetrating everywhere sweeps into all inlets by the wayside, and when they will hold no more the water runs out the way it came in, this often occurs before the flow and set in of the ebb. But this illustration is not quite correct, for to explain by it alone, the tide must be supposed to be always flowing, and its overflow running back, but it is sufficient to convey my meaning, which I will fully explain next week. Briefly, I believe the present method of ventilation by sucking air through a mine to be a most erroneous system, and that air ought to be delivered under pressure at the face of the coal, from whence it would find its way out. It is easy to do, and not costly. J. D. Shakespear, A.M. Inst. C.E.

Great George-street, Westminster, Sept. 30.

MINING IN COLORADO—ALMA DISTRICT.—No. XI.

Sir,—In my last letter I thought I had closed up an account of all the chief mines around Alma, but every week some new and valuable discoveries are being made in all the creeks. These are tributaries of the Platte river; the chief of them are known as the Old Buckskin, Mosquito, Pennsylvania, and Sacramento. Every creek produces different kinds of ore, but it may all be classed as silver-lead in a commercial point of view, for the amount of copper is small, ranging only from 8 to 20 per cent. The gray copper is generally very rich in silver, and so is the antimony, which is associated with the lead. The specular and manganites of iron run very well in silver, especially when decomposed by atmospheric action. The sulphurets of iron carry the most gold, chiefly when granulated. The coarse cubical mundic is of very little value, only for sulphuric acid manufacture. These ores contain 40 per cent. of sulphur; the residue is almost entirely iron.

Now comes a new mining arena. The old town of Montgomery, which for many years has been in ruins, is about to be rebuilt by the miners. It is at the head of the valley of the Platte, 6 miles from Alma. Here is the Hoosher Pass, a slight depression in the mountain range, the road leading down to Blue river, and on to Breckinridge, the court house town of Summit County. The whole of the country is alive with gulchers, miners, and prospectors. The chief wealth is derived from the placer works. The gold generally is very coarse and rich. I have had many nuggets that weighed over 2 oz. About four miles from the summit of the pass are the Monte Cristo silver mines, belonging to an influential Denver and New York company. Some years ago they were worked in the valley for gold alone, but did not pay. The new mines are on the hill some 800 ft. or 1000 ft. higher up, and three-quarters of a mile from the village. There do not appear to be any lodes. The ore thus far opened on is an antimonial silver-lead and copper, lying in a seam 3 ft. thick, and only 6 ft. from surface; therefore the operations are more in the form of quarrying than mining. This deposit appears to extend over many acres of ground. It is of low grade, carrying only from 15 oz. to 40 oz. of silver, with a little gold; but there are little thin streaks of silver glance that assay from 300 oz. to 500 oz. There is a very bright gossan lying on the top of the lead about 3 in. thick, that carries nice specimens of gold. The geological formation on the hills is secondary Devonian, the valleys being Silurian. The ores are being concentrated from 3 and 5 to 1, bringing the produce up to $150 per ton, at which price it will pay for transportation to the Denver Smelting Works, silver now being $1·14 per ounce. To effect the reduction a fine new mill has been erected, with a powerful engine and complete plant of improved dressing machinery. The sawmill is driven by water-power. A fine stream of water runs through the village, which consists of the mills, stores, smiths' shop, boarding house, miners' dwellings, assay office, stables, &c. The mines are in four claims, each 1500 ft. by 150 ft., comprising an area of 41½ acres. The bottom lands consist of a 5-acre town and mill site, and a 320 placer claim. The hill lands are in heavy pine timber, of which the company owns 300 acres, amply sufficient for the works for years to come.

In the Hoosher Pass are several new mines. Two of them, the Ready Pay and the Dirgo, have opened on large courses of ore. It consists chiefly of silver-lead.

Montgomery may be called the head of the valley of the Platte, where it terminates against lofty mural cliffs. It is exceeding picturesque; but a stream of water to the left continues for 5 miles further up, in a narrow valley with precipitous sides. Many of the old mines are being reopened, and new ones commenced. Very rich ores in gold and copper are being brought down. Some we have in the office are worth $1000 per ton. The averages, I think, will run from $80 to $150. Under concentration, of course, they will be about double these figures. The gold is very fine grained; it carries but little silver. The formation is Silurian, and in it may be found almost every rock of the system. A large new stamp mill is about being erected, and smelting works are in contemplation, so that within another year the old deserted town will take a new lease of life. What is wanted here is English capital and English mining energy.

The Alma carbonate ridge is within two miles of the town. Over forty mines have been located this summer, and shafts are being sunk on many of them. The formation in which they are located is between the lower beds of the Trias, and the upper sedimentary Devonian. It very much resembles the Leadville hills, but contains much less hydrate of iron. The deepest shaft is down about 60 ft. The silver is in an argillaceous carbonate of lime, without any lead. At surface the stuff only carries 2 oz. of silver, but at 40 ft. it runs up to 39 oz. This shows that depth alone is wanted. Thus far it is all rich and good ground, but is becoming harder in the bottoms. Should the ores increase in quality this will form a large new mining district. The ridge is about half a mile wide, and extends from the foot of Silver Hills Mountain for three miles. I expect before the summer closes there will be more than 100 mines located. With the exception of the large regularly worked minss of Mount Bross and Lincoln very little is doing but prospecting, and this is being carried on all through the country. Some very fine strikes have been made the past week in Mosquito and Buckskin. Mont Bross is again coming to the front. The noted Dolley Varden is the chief mine; with only about 20 men it clears about $40,000 profit per annum. Seven new mines near it have been opened this year; they are owned by Messrs. Weiner and Hene, merchants at Alma. I am informed good bodies of ore have been cut in all the exploratory workings. Specimens sent down to the office run from 120 oz. to 300 oz. of silver. There are about a dozen other mines being opened up along the mountain side.

The great discoveries on the Loveland ridge, familiarly known as the Fannie Barret group of mines, will form the subject of another article.—*Alma.* Charles S. Richardson, G.M.E.

CANADIAN MINING NOTES.

Sir,—The mining news in Ontario is chiefly from the county of Hastings. In that county the townships of Mammora, Madoc, and Elzeiver have been subject to various excitements in the way of mining strikes ever since the year 1867. It was about that time that the Gatling Mine was discovered. Mr. Gatling is, I believe, the brother of the inventor of the Gatling gun, now so famous, and perhaps the mine will eventually turn out as famous as the gun. The Gatling Mine is on a reef of quartz, in which mispicle was found; this assayed high in gold, but the difficulty was in the working and reduction of the ore. The process employed saved so little of the gold that it was evident some other process had to be found. The shaft was sunk, and when it reached 120 or 130 ft. the vein was "pinched" till it was only about 6 or 8 in. wide. They sunk further down, and passing the "pinch" the vein widened, and a rich find was brought to light, with free gold discernible to the naked eye. Mr. R.P. Rothwell, the editor of the Mining Journal, New York, is, I believe, engaged in developing the mine.

The Frontenac Lead Mine is, I believe, about to change hands. If the shareholders of that mine know anything they would adopt the Missouri system of mining, and by means of rock-drills and boring discover the extent of the lead deposit. There does not appear to me to be much doubt that a large amount of lead could be found. Instead of spending their money on men and machinery before they find out where the lead is, and how much there is, one would suppose they would adopt the Missouri system; this system takes a core for (say) 1000 ft., or as deep as they want to go. There is no better place in the world for lead mining than Canada with our present protective policy.—*Brockville, Ontario, Sept.* 24. Bournonite.

MINERS' WORK—AMERICA AND CORNWALL.—No. II.

Sir,—It is only too true that miners earn more money in Nevada than they do in Cornwall; but the work in the mines differs greatly in the two countries; and after deducting the 6*l.* or 7*l.* per month for living the miner cannot, even in Nevada, put by 17*l.* 16s. "for a rainy day." All months do not contain 31 days, and the amount mentioned for living does not include such necessaries as clothes, boots, hats, &c., which are as requisite to the Comstock miner as mere living. Comstock miners live well, work hard, and get good pay; and although they cannot put by for a rainy day as much as a "Lover of Truth" insinuates, yet for all that they are much better off than their brother miners in Cornwall.

I have not written the above to criticise the statements of Mr. John Rule or a "Lover of Truth," both of them having made several truthful statements, although in some points rather perverted. My object is to contrast the working of a Cornish miner against a Comstock miner, and to endeavour to show where the system of the latter may be employed by the former, with benefit to himself and his employers.

It has been stated that if Cornish miners worked as hard as miners work in other parts of the world they would earn more money than they do. I agree with that statement as regards their pick and hammer work; though this I assert, that Cornish miners do work hard, but a great part of the work they do is unprofitable and useless, which is not the fault of the miners themselves, but is the fault of the system and conditions under which they are compelled to work. Therefore this question occurs to me—Can men work the same in the Cornish mines as they do in the mines of Nevada? I think that, under existing circumstances, they cannot. A brief sketch of a miner's working day, or core, of eight hours in each place will explain a great deal, which I give as having actually occured to me as a working miner. The Cornish miner often lives a mile or two—sometimes four or five miles—from his work, after his long morning walk arrives at the mine fatigued and jaded. He then changes his walking clothes for his heavy underground togs, has then a walk of some distance to the footway shaft, where he commences his journey into the bowels of the earth, carrying with him very often a sling of borers, can of water, powder in a can, fuse, candles, and in fact nearly all he requires with which to complete his day's work, besides his lunch, which is an inevitable part of his load; and after about half an hours descent by ladders, winzes, and a scurrying down the skiproad if the shaft underlies pretty much, so as not to require ladders; and in his journey to his work, having to traverse long levels, and cross-cuts as well, he finally arrives near the point at which he labours for his pay, tired and almost exhausted, he has to rest himself before he can commence his regular labour, which occupies from one to two hours of his day; so this, with the time waiting for smoke to clear away, lunch time, and a rest before the hardest part of his work—climbing to the surface again, where he generally contrives to reach a few minutes after the expiration of his eight hours, thus leaving him about four hours to work in the mine. In Nevada the miner lives close to or within a few minutes walk of the mine. He arrives fresh and unexhausted at the mine, steps into the cage, is then lowered to the level at which he works, there changes his clothes, goes to his work, takes the tools from the hands of the man he relieves, and goes on with his work until the Boss calls time for lunch; after which he goes again to his work, and there he remains until relieved at the end of his eight hours. He then changes his clothes, steps on to a cage, and is hoisted to the surface, where he arrives a few minutes after the expiration of his eight hours, or working day, thus having worked about seven and a half hours out of the eight hours. Now, under such conditions is it possible for men to work in Cornwall as they work in the Comstock Mines? Echo answers—No! Can the Cornish mines under their present circumstances and conditions be adapted to the system under which the Comstock miners work? In my opinion they can, as far as to allow miners to work harder than they do, and also to earn more money, as some would wish them to do, and, therefore, it is useless as things are at present managed to condemn the Cornish miner for not working hard enough, for besides the disadvantages described above the conditions under which he is bound to labour preclude the probability of his ever working harder than he does at present, or ever earning more money. With all that has been said about the Cornish miner not working hard enough, &c., it has never been averred that he is lazy, because every one who has any thing to say about the matter knows it is not so. Only let a Cornish miner see that he can earn more money without injuring his future prospects and he will work hard enough. Then comes the question—Why not let him earn more money and work harder? Cornish mine agents know that miners do not work so hard as they might do, but one man is powerless to make a change in the system, but a combination of one and all concerned might make such a change in Cornish mining in a short time as to have dividend mines where are now mines making calls, and mines developed in a much shorter time than is at present required, which would be much better for the permanent investor, because he would get much better value for the amount invested. Better for the speculator, as he would be able to make or lose a fortune in a much shorter time than it takes now to do it. Better for the working miner, because he would earn much more money, and would give a proportionate amount of work for it. Better for the merchant, because he would supply more materials in a given time—in fact, it would be much better for every one interested in Cornish mining, and would make it a flourishing business, instead of the miserable dragging existence which is the lot of many Cornish mines and miners too.

Some will say that such changes cannot be made without upsetting all existing arrangements. I say a great many changes for the better can be made in almost every mine in Cornwall. "Rome was not not built in a day," neither can these changes be all made in a day; but a great many might be made in an incredibly short time. In mining, as in every other industry, time is valuable; but, alas! how few are the endeavours to make the best of time in the working of Cornish mines. The first great necessity to make the most of time in Cornish mines is the means of quick ingress and egress for the miners. The man-engine has done a great deal towards that object where it has been adopted, but at best it is a very poor substitute for the cage, both in point of time and ease to the miner; and I think, as regards safety, that the cage stands first. And until this means of descending and ascending to and from the mine is adopted Cornish miners will not be able to work as hard as miners do in Nevada. Some will contend that cages will not work in many of the Cornish shafts, but in that they are mistaken. Cages to carry 10 or 12 men at a time would work in almost any shaft in Cornwall, and that is as many as are conveyed at a time in most places, and the expense of this would not be very great where skip-roads and wire-ropes are already in use. A Cornishman.

FLAGSTAFF SILVER MINING COMPANY.

Sir,—Nearly five months since (May 8) the Secretary's circular announced as follows:—

The syndicate referred to in the directors' circular of March 13 has made considerable progress. Since that date the number of members has been increased, and about 8000*l.* has been paid into bank. Further large sums are at present being negociated, and your directors feel assured that no unnecessary delay in taking proper steps to form a new company will be permitted by the syndicate.

The same circular also says:—

Steps are being actively proceeded with, and have been in motion for some time past for putting matters respecting the title to the mine on a just and proper basis.

Prior to this, in the circular of March 13, the raising of the money and the purchase of the mines was called an "accomplished fact," and the words "in the event of a good and valid title being obtained" were used, but in none of the subsequent circulars nor at the meeting of shareholders has one word been mentioned by the Chairman about his boasted syndicate; and now, after the lapse of a period of seven months, the same farce, with a slight financial addition, is being again enacted, notwithstanding that since the meeting of shareholders independent parties have actually purchased and are in full and undisputed possession of the most valuable portion in what was once known as the Flagstaff Company's property.

An appeal to the Supreme Court at Washington is pending respecting the title to ⅞ths of the remaining portion of this property with the exception of 100 ft., which is the only bit of the lode that can legally be dealt with for the next three years by the reported directors' re-organisation. The Secretary, in the post card of Sept. 29, informs us, however, that the directors are arranging for a "speedy re-organisation" of the company on a basis which they believe will be readily accepted, &c. It is quite clear that their "basis" can include only 100 ft. of the Flagstaff lode; and the directors, notwithstanding the assistance of "an influential firm," may find upon calling the shareholders together that they will not be induced to support any other scheme than one having for its object the acquirement of all the property so well and favourably known as the Flagstaff lode when in their possession. The morality of the recent attempt under such circumstances, even though countenanced by "an influential firm," to bolster up the shares of this company I will leave to your readers to form their own opinion about.

An editorial notice in the *Mining Journal* some time since warned the public against dealings in such shares, and for a time this warning had a salutary effect, but now the gambling has become nearly as active as before.—*London, Oct.* 7. L. Heath.

RUSSIAN COAL FIELDS—IRON—No. IV.

FINLAND (LAKE) IRON ORE DEPOSITS AND FORESTS.

In this letter I would draw the attention of your readers to the Far North to ironworks in Finland, which I visited. Leaving St. Petersburg by the morning train, and passing through Wyborg, one of its largest ports, and which is fast increasing in importance for export of timber, I arrived at Helsingfors, the capital of the Grand Duchy of Finland, late in the evening. It was in the dead of winter, and, although the cold was ranging about 33° below zero Fahr., it was not at all disagreeably cold, from the fact of the atmosphere being so rarified and dry. Next day I made arrangements with my Helsinfors friends for a 300 miles sleighing journey to the ironworks north of Lake Ladoga, it being also arranged for my comfort that the Government Inspector of Mines, Mr. Furuhjelm, of Helsingfors, should accompany me. I found him a most agreeable companion, speaking English well, and considerably versed in English literature, with a fund of information, and well posted in the varied folk-lore of the country—both legendary and otherwise; and who was known and respected by everyone we came in contact with during our journey. We remained for one day to lay in necessary provisions—such as cooked fowls, cutlets, steaks, and various other comestibles, including tea, sugar, eggs, butter, and some bread, trusting to good fortune to find milk and the usual country bread (which, although coarse and black, is very acceptable when travelling). The early morning following we started in what is called a "tarantas" sleigh—that is, in the summer it was a tarantas or hooded gig on two wheels, and in winter it was divested of its wheels, and placed on runners, transforming it thereby into a sleigh; no seat in it except what was made with hay, so that we half sat and half reclined; the provisions in front, on the floor, packed away in a series of baskets and boxes, all covered over with hay, and over that a couple of bear-skin, which also covered us. We were besides well wrapped up in fur coats and caps, drawn over the entire head, with the exception of an orifice for the eyes, nose, and mouth; our feet and legs in long fur boots, the outside being bound round with wisps of hay. It was a gloriously bright winter's morning, the sun rising splendidly, and as we rode behind three very fair trotting horses, with their merry sleigh-bells for ever jingling, through the keen fresh air it was most exhilarating. At about every 10 miles we stopped to change horses, and sign our names at every post-house in the official book (and in which the traveller can write whatever complaint he has to make, if any), and refresh ourselves with tumblers of hot tea. The posting-houses along the route are exceedingly clean, and you invariably experience a bright and cheerful welcome from the postmaster and his family. The peasants are thrifty and industrious, and in many cases are well to do; but, as a rule, they are not blessed with a superabundance of this world's goods. The country is governed by a code modelled upon the Swedish code of laws. The Finns have their own Parliament and Senate, and are not dependent upon Russian rule (since the Turkish war conscription has been extended to Finland, but except in the time of war they are not obliged to serve out of their own country). The Czar is their Grand Duke. The money of the country is the mark and pennia—a mark is equivalent to a French franc, and 100 pennia go to a mark; the 20 mark gold piece is the same in value as the Napoleon or 20 franc piece. The silver coin is really good silver—the pennia bronze.

We travelled all through the night, a splendidly clear moonlit sky guiding us everywhere, and lighting our way across lake and plain. The next morning, on arrival at a village of importance called Lappwesi, and finding that the post-house was a little more pretentious than those we had left behind, we halted for breakfast, which necessitated an inspection of our commissariat stores. The steaks and cutlets required thawing to bring them into a condition for cooking; then gradually temper the butter, and re-bake the bread, to make it soft enough to eat. The milk was rich and good, but from the intense cold was of the consistency of clotted cream. We enjoyed our breakfast, the midnight and early morning drive through the keen atmosphere having considerably sharpened out appetites. We resumed our journey crossing the Saima Lake, about 8 miles below the falls, the roar of which we could distinctly hear, although the falls were hid from view by a large island covered with timber. On we sped night and day, only stopping for the purpose of changing horses, which occurs frequently, and in those intervals we naturally did justice to ourselves and the things we brought with us. The scenery was not of a very varied nature with the winter garb upon it, as everything in the open looks much the same—whether hills, plains, or lakes—at a distance all had the appearance of one vast sheet of snow. Except for certain marks it was difficult to know when you were upon a lake or on *terra firma*. All was snow, soft as swansdown, each particle separate as a grain of sand, impossible to make a snowball—I tried often. You can squeeze it as hard as you like in your warm hand; it will not cohere, but falls to powder, as if you had taken a handful of dry sand, and tried to make a ball of it.

Passing on our road many clean comfortable-looking villages, which appeared the more so perhaps from constrast with the cold bleak out-

look, we came close to a large massive stone building, which had almost a sullen aspect, and the sadness of its appearance was greatly enhanced on finding by enquiry that this was the largest prison in the country, and wholly devoted to one unfortunate class of criminals—women who had been deceived, and who by the inexorable laws of Finland society in general are shunned by all grades, forced to hide their shame and disgrace, have in the poignancy of feeling and reflection upon their lost condition, and the shame they have brought or are likely to bring upon their families as well as themselves, sought to blot out of the world the intruder upon their peace by committing infanticide, and often endeavouring to add to that suicide. There were at the time we passed it 700 occupants, most of them sentenced for life.

In time and with the exercise of patience we arrived at the last Government post (Sordavala) in the middle of the third night. The host and his family most obligingly made us as comfortable as it was possible for them to; lit fresh fire, made tea, fried eggs, warmed one of our fowls, &c. After our meal we started off once again, and the evening of that day brought us to our head-quarters—the Wartsila Ironworks, which are the principal ones in Finland. The works comprise two blast-furnaces on the Scotch model, with a fine pair of blast-engines, and complete rolling-mills, the machinery of which is of the best description, supplied by Messrs. Börsig and Co., the well-known engineers of Berlin. Everything is in good order, and constantly kept so. They remind one of Messrs. Crawshay's Works at Merthyr, which have always been looked upon as model works. The blast-furnaces are fed with ore obtained from the lakes by means of dredging—the proprietors having the sole right of dredging ore over 75 lakes, covering an area of 197 square miles, and from the beds and shores of which the ore is obtained by means of men on rafts with long-handled dredging-nets, who gather it up and afterwards deposit it on the banks, and there allow it to dry, when they make up clamps, throwing amongst the ore small charcoal, and set light to the several masses for the purpose of calcining the ore before transporting it to the works. This is in the summer; but in the winter holes are made of considerable size in the ice, the men standing on it, a space being cleared of snow here and again on which the ore is deposited in heaps as dredged out, the sledge carts transporting the ore direct from these heaps to the works, and there calcined. The dredgers are exceedingly skilful, and bring up large quantities of ore (but by using a proper dredging machine an infinitely larger quantity could be obtained, and at a much less cost than by hand-labour). Around the works are the usual accessories to an extensive establishment of the kind; the general shop, the property of the estate, supplying to everyone of all degrees all the necessaries of life (from a needle to a frying-pan, food of all descriptions, and from coarsest cotton or woollen cloth to the latest and most approved style of bonnets and hats for both men and women), which is of itself a very profitable department. Cottages for the workmen, well built, comfortable, and very clean; a Protestant church, with its steeple rearing its head amongst the many chimneys, the incumbent of which is appointed by the proprietors, but the Government paying half his stipend. The manse is a Swedish villa nestling in the centre of the village, the latter occupying more space than is usual with us—so that the parson is truly in such a place the shepherd of his flock, quite out of the busy world, always amongst them, knowing all the family histories, and making all their joys and sorrows and troubles his own, and doing his best to share them with his people; he is naturally very highly respected. There are, besides, the general managers' houses, as also those of the chief cashier and other clerks—all good and substantial. The house of the late proprietor, in which one of the sons resides, is a large well-built mansion of the Swedish style.

Leaving our tarantas sleigh at Wartsila we started off one evening, now in small single sleighs, as the tracks through the dense forests were too narrow to allow of our using the large one; and, as we were now separated and no covering overhead, we were not likely to be any warmer or more at ease. The night was something marvellously beautiful, and the cold was proportionately intense; besides extra wraps, I had a double piece of new flannel bound round my head, for the purpose of enveloping my nose. Scarcely had we been out an hour than icicles an inch long were formed from the condensation of the breath. I would urge those who travel in such districts never to be induced to touch spirits from the fallacious idea that it keeps the cold out; it is, on the contrary, the surest means of letting the cold in, for without taking anything stronger than tea it is with the utmost difficulty that you can prevent yourself from succumbing to the exquisitely delicious feeling of desire to sleep which even the greatest fatigue in a more temperate climate could not induce, and should you give way to it when exposed in a sleigh in 99 cases out of 100 it would prove to be the last long sleep of death. The next evening we arrived at the commencement of the large forest of the northern part of the estate, where there are also two blast-furnaces, the pig-iron from these works (called Mökhö) being sent to the Wartsila Mills to be worked up. The fuel exclusively used is charcoal, made in kilns built in clear places here and there in the forests; the tar is collected, and used for various purposes. Besides ordinary iron ore in the lakes is found manganiferous iron ore, with a large proportion of manganese, from which spiegeleisen is made, and sold to the St. Petersburg steel converters; but with applicances Bessemer steel could be manufactured. The northern forest was so dense that we had to leave our sleighs at the posting-house, and resort to the use of snow-shoes, which are not easy to navigate with at first, and until you get used to them you find yourself every now and again photographing yourself on the snow, which has a depth of not less than 18 in. to 2 ft., and in many places much more. These snow-shoes are long flat pieces of wood not thicker than a medium ordinary boot-sole, the width about 4 in. in the middle, which has a strap across, through which the foot passes, tapering to each end to a point; the entire length of the shoe is 4 ft., so that to walk gracefully, especially on the yielding snow, is not by any means easy.

This forest, which is by far the largest one on the estate, is mainly composed of trees having a diameter of from 9 in. to 14 in. In due time, having thoroughly examined the forests (which, by the way, presented a beautiful appearance in their winter dress—you might almost fancy yourself set down in some gigantic enchanted, but exquisitely charming, hall of sculpture, peopled with innumerable statues of the most perfect chiselling in the purest carrara), I returned to the principal works at Wartsila, and completed my examination, and took samples of some of the ores of the different lakes—pig-iron and rolled iron, turned out in my presence. The ore, as I before stated, in the lakes is practically inexhaustible. Thus, assuming that only 1-10th part of the lake surface (197 square statute miles) contains ore, and that the average thickness of the beds is only 1-10th part of a foot, the totally quantity of ore actually in the lakes would be about 55,086,718 English cubic feet, or 2,203,468 tons of ore. The regeneration of the ore in the lakes is very rapid, and by working some lakes for a time, and then letting them rest and working others, it has been proved that the supply does not diminish.

The following are two analyses made by Mr. Frederick Claudet—one of an hydrated oxide of iron, the other containing a large percentage of manganese:—

	No. 1.	No. 2.
Peroxide of iron	66·10	22·82
Oxide of manganese ($Mn_3 O_4$)	3·84	42·56
Silica	7·54	5·05
Alumina	1·46	·92
Baryta	Traces.	1·31
Lime	·56	1·16
Magnesia	·24	·22
Phosphoric acid	1 28	·65
Sulphuric acid	Traces.	—
Moisture given off at 212° Fahr.	6·60	12·48
Loss on calcination, combined water, and organic matter	12·90	13·22
Total	100·52	100·29
Metallic iron	46·27	15·97

The iron from these works is much esteemed in Russia, and obtained the gold medal at the Finland Exhibition in 1877. At Laskela, at the north-east corner of the head of Lake Ladoga, the main saw-mills are situate, the motive-power being supplied by a stream dammed with massive masonry, yielding an effective of 807-horse power, driving a 45-ft. undershot wheel, giving motion to four sets of vertical double-acting saw-frames, besides several circular saws. The stream was roaring down the channel to the mill, forcing its way through apertures in the floodgates while there was more than 3 ft. of ice on the surface—so that summer and winter the mill is constantly running, which is (with its present plant) able and does regularly turn out into cut timber, English sizes, 400 logs every 24 hours, working night and day (Sundays excepted).

The whole of the estate I have been describing, including forests and the Mökhö and Wartsila Ironworks, and Laskela saw-mills and property immediately around, and the small home farms, has an aggregate area of 292,056 English acres.

In my last communication, speaking of petroleum oil, I omitted to say that the Russian bright, unctuous, heavy oil is esteemed on the London market much before the American oil for lubricating purposes, and obtains considerably higher prices, owing to its greater lubricating qualities, coupled with the fact that it will not freeze, which for such purposes is a great desideratum. The steamers on the Caspian use not only the refuse from the lighter oils, but use the heavy oil raw as it comes from the wells. I was sailing at different times on the Armenia and Petrovsk, and was on board the Cesarewitch, each using the raw heavy oil, as well as refuse when they can get it in sufficient quantity, such is the demand for the latter, as I mentioned in my communication to the Journal of Sept. 18. Most of the oil on the Island of Tcheleken is of this heavy unctuous nature, and very valuable. The oil can be delivered in London cheaply, leaving a very handsome profit, even selling it at the same price as American lubricating; but the Russian always commands, from its peculiar properties and intrinsic worth, a much higher price.

London, Oct. 1. VERITAS.

TIN MINING IN CORNWALL, AND AUSTRALIA.

Sir,—Mr. Lean has my full pardon for his strictures on my remarks at Wheal Peevor. Surely I am not reported as having said absolutely that there is no such thing as a lode in all the great continent of Australia. It is most remarkable, however, after so many years diligent search that payable tin lodes have not yet been discovered. More than once has what has seemed to be the back of a rich lode been found, and considerable machinery has been erected, but it has proved to be a mere V-shaped deposit, growing "small by degrees and beautifully less," till it has dwindled to just nothing at all—a small crack in the rock and a big crack for the adventurers. Now, if Cornwall has been able to live despite the fact that tin could be had in Australia for merely shovelling it up at the surface, surely there need be no fear of lodes which are yet undiscovered. Surface deposits are comparatively soon exhausted, and a Dolooath would cost something to work in Australia

Of course, I cannot dispute Mr. Lean's geological deductions. I dare say he can account for the fact that some of the best alluvial deposits in Cornwall have been found on our highest tableland, and far away from any known lode. Perchance, in times remote, heavy matter ran uphill. I incline to the old-fashioned notion—geology apart—that "where it is there it is."

St. Just, Oct. 6. R. Boyns.

MINING IN ALGERIA—No. II.

NOTES OF A JOURNEY FROM DJIDJELLI TO BOGIE, CROSSING THE DJIBEL HADID (OR IRON MOUNTAINS).

Sir,—Last week I left off in my Notes—No. I. on April 29, at the Roman fort and River Gingen, where we stayed the night, pitching our own tent in a flat dry piece of ground above the river.

April 30: Got up at 5 A.M., went down to the river and had a bath, dressed, and was walking back to our tents when I saw my friend Capt. Joe (who had got quite over his sea-sickness, and now looking red in the face from the burning sun) running towards me, out of breath. "I say, Mr. ——, there's a fat fellow up here kicking up no end of a row, saying we sha'nt proceed an inch further; and the brute has drank all our coffee, the cook gave it him; and there are about 30 Arabs with him, all dressed in white night-gowns. Oh! I wish I had taken my wife Mary's advice, and never comed into this awful country." "My dear fellow," I said, "pray don't go on so. It's all right; I'll make it right!" "Yes, that's all right, Mr. ——, but nobody can understand a word they say;" and my friend retired at the same time behind a cork tree, to see that positively his pistol was loaded. On my arrival up the hill to our tent a short fat little unshaven Frenchman came forward, and in the most sarcastic manner said, "Bon jour, monsieur. I am an engineer of France, you, Mr. ——, are required to show your pass and papers." I opened my pocket-book, and showed him a letter, &c., signed by the Governor, in Alger, and viséd by the general officer in Djidjelli. On seeing this he became most polite. He would go with us, he would protect us; and, in fact, he was very polite to Capt. Joe (who never forgave the coffee), and he would see that we had every information about any mines we wished to see or inspect. While I was talking to this French engineer (as he called himself), my friend Capt. Joe came to me in great glee, as one of the Arabs had given a splendid piece of hematite ore, as also some very rich copper ore. But to proceed on our journey. After kissing hands, which is the custom, great shouting, dogs barking, and striking our camp, we proceed some six miles up a rough narrow path on to a sort of plain or platform, from which I must describe the view, while my friends finish their breakfast, which consists of Arab bread—the loaves being 6 in. round and 2 ft. 6 in. long—coffee, cold fowl, fruit, and tobacco. On our right is the sea, some 2200 ft. below us, with a number of small points running out into it from the land; on our left is the high mountain of Babon Tababor, Sheik Ben Keriba, or Beni Marmi of the heights. On the top of this mountain we can see snow. Before us is the Djibel Hadid, and the port of Taza and Djidjelli behind. I notice a white lode of carbonate. It is supposed coal in small quantities is near this spot—El Rhifats. A thunderbolt fell here, with a land slip, and the earth is very black below the road. There are lots of cattle about, and long Diss grass. After a great row between Siliman, a tall Arab, and the fat Frenchman, for kicking his dog "Too," we proceed. It appeared afterwards Master "Too" (a dirty little French cur) had run off with Siliman's loaf. It now begins to rain, and a fog sets in. I ask an Arab if it will continue, and his answer is "Oullah," or God knows; they always say this, or "Yaref," He knows. We send on a messenger to the Kaed Boarour and Beni Marmi of the heights, to say we shall arrive about 5 P.M. We now rest for dinner, and our drivers feed the mules, which are all tied by the legs in a long row. Capt. Joe and myself take a walk up the hill and get a bundle of the Diss grass, which we intend taking to England to be tried for paper making. There are hundreds of acres of this tough grass. It is very like Esparto, only with a flag end.

Calculation for 1 ton of Diss delivered free in any port in England:—To shore 1*l.* 5s., stacking 3s., insurance 1s. 6d., freight 1*l.* 5s., loss of weight 5s., commissions in Algiers, and supervision, &c., 5s., cost of pressing in bales of 150 kilogs. 15s., wharfage dues, &c., 1s., general contingencies 5s., 2½ per cent. interest on working capital 1s. 6d., interest and depreciation of stock 1s. 4d., commissions in England generally 1s. 8d.: total 4*l.* 10s., to deliver (say) 2000 tons a year.

It now stops raining, and we procced, still up the hills, over a terrible path winding round and round until we reach the ridge, and then descend down a steep narrow path to the river and domain of Beni Marmi and the Kaed Boarour. The Kaed is a bold, dark, stout-looking Highlander, 6 ft. high, with black moustache, and whiskers cut close to the face. The little Frenchman trots on in front, and at last we arrive amidst great shouting by the muleteers, and as usual barking of dogs. We are shown into a reception tent, with a fire in the middle, matting and carpets spread all around; we take off our wet things and change, when the Kaed comes in, and is introduced to us by our interpreter, accompanied by his attendant, a tall fine young fellow with very white teeth. The introduction to the Kaed is to shake hands, and then he kisses his fingers and you kiss yours. The lower class kiss the Kaed's hands, and the rich bend or lean over, afterwards the Kaed places his hand on his heart. After our introduction is over the men pitch our tent for themselves, feed the mules on young Diss grass, and then we all retire after a most tiring day and a good dinner.

Sunday, May 1: In the afternoon the fog cleared away, and opposite our tents we saw the great mountain Tababor, Djibel Hadid being some miles nearer to us. Capt. Joe and myself having helped to cut a gutter round our tent to take the water away we walked to see a wonderful cave and cavern, which is full of stalactites and bats, and some 2 ft. deep with guano—say, about 250 tons. It might pay to send this guano down to the port of Taza, on mules, and ship it to England. Near this is a lead lode, showing in the road, and down in the River Oued Azer, under Djibel Hadid. The Kaed's name is Lucuff Hamid. The walls are a sort of white clay mixed with killas; the lode runs about east and west. Further on, about a mile, is another lode, called Boumarow, and some very nice samples of ore came from there. These lodes have never yet been worked. We return just before dark, and find a most polite note from the Kaed, asking us to dine with him to-morrow night on our return from seeing the great iron deposits and copper lode. After dinner some more Arabs bring samples of ore from all parts of the mountains for us to see—hematite, copper, lead, gypsum, and some very poor phosphate. We are informed we are the first Englishmen that have ever been here. Capt. Joe has a great argument with the Frenchman, who declares a small round piece of kidney ore is a part of a thunderbolt. Capt. Joe's last words before he goes to sleep are "I say, Mr. ——, the hignorance of that Frenchman beats all I ever did see!"

R. G. S.

THE CAPE COPPER COMPANY.

Sir,—I am glad to see attention directed by "W. W." to the comparatively low price of Cape Copper shares. He compares them with debenture and preference stocks, that can never under any circumstances yield over 4 per cent., whereas Cape Copper now pay nearly 10 per cent., and would pay more but for the low price of metal. But if the shares are compared with those of other mines now selling to pay 5 per cent. the difference is very striking; for instance, last year Great Laxey paid 19s. in dividends, and the shares are now quoted 18*l.* to 19*l.* The Van shares paid 1*l.*, and are also quoted 18*l.* to 19*l.* At this rate Cape Copper should sell for about 80*l.* per share, instead of, as at present, but little over half that price. No doubt your correspondent "W. W." is right in his conclusion that the present selling rate is much too low. But there are some dealers who give the public advice gratis in monthly circulars, &c., who wish us to look upon these shares as much overvalued at 41*l.* to 42*l.*; what must those gentlemen think of the prices of mining shares that sell to pay no more than about 5 per cent.?

An Original Shareholder.

THE INDIAN GOLD COMPANIES.

Sir,—Can any reader inform me why the depression in the market price of South Indian Glenrock Mines, while that of the Devala is just the reverse, taking into consideration that the reports of Mr. Brough Smyth are just as favourable to the one as the other. In the case of the South Indian the forward state of their machinery will soon bring to a practical test whether the conclusions Mr. Smyth has arrived at will be remunerative, and this will prove whether all other Indian mines are to be successful or not.

One Interested in South Indian.

GOLD MINING IN THE DUTCH WEST INDIES.

Sir,—Having observed in several recent Journals various letters evidently written by parties who have an interest in either supporting or opposing the new project of the Aruba Island Gold Mining Company, I hope you will allow me space to say a few impartial words. After all that has been said for and against the scheme, and as a speculative investor of capital, and having suffered rather severely by being tempted to go into sheer speculations on the faith of reports, I will venture to give advice without prejudice for the object of cautioning the public against venturing in this as well as any other concern that has proved a failure after years of undoubted perseverance of able and skilled men of experience, which you must admit if you mean to again trust the same managers of this company, who undoubtedly have already done their best. It is all very well for certain interested parties to say and write this and that, but if they were as free from losses in this old and tried undertaking as the greatest stranger, I am inclined to think they would be the last to venture, but be tempted rather to seek some other untried concern, and with their flow of soft language might form a new company, as there are many of such kind of speculations in the market. My advice is now-a-day, before going into this or any other concerns, to secure reliable opinions, based on visits from parties who have been there, and even then extreme caution seems necessary. To those who are determined to go into this company, let me advise them first to ask, What is to be done with the new capital? As to the Phosphate, as far as I know one cargo has been shipped by the Aruba Company, but I believe they were unable even to realise anything like the pure outlays made for expenses to raise and transport it, so that it had to be stored. What has become of this cargo? Where is the exact statement about this trial, so as to judge if it would be worth shipping?

A Shareholder.

GOLD MINING IN THE DUTCH WEST INDIES.

Sir,—Mr. Chumaceiro is too audacious when he claims to have treated the above important question with an open face. He is the salaried agent of the persons who have been doing their best to injure and oppose the Aruba Island Gold Mining Company for the past seven years. He is, in short, the hired enemy of the gold and phosphate companies who are working in Aruba, and yet he puts himself forward in the Journal as a purely impartial disinterested person anxious, out of simple loving-kindness and an overflowing heart, to acquaint your many readers with the private advice he had given his friends on the subject of Aruba gold mining.

There is scarcely a statement made by Mr. Chumaceiro respecting the Aruba Island Gold Mining Company which is not the reverse of the truth. It is not true that both companies are seeking more money; it is not true that the money to be subscribed is to be used in paying off mortgages; it is not true that the report of Messrs. John Taylor and Sons has been proved incorrect. On the contrary, its correctness has been proved by the actual stamping and treatment of about 4000 tons of ore, and the making on the spot of nearly 1000 assays. Not even Messrs. John Taylor and Sons expected that the average assay of the Aruba gold ores would give (as they have given since the work was resumed) 1¼ oz. of gold per ton. It is not true that the mines proved a failure (save in one instance, for want of capital) in the hands of former owners. On the contrary, the mines worked in the crudest way laid the foundations of many fortunes in the colony. It is not true that the mines have proved a failure under the Aruba Island Gold Mining Company. The litigation and disputes between the Government and the company, since amicably settled, stopped the company's operations for four years. Since work was resumed the gold yield per ton has exceeded expectations, and it is proposed to invest more money simply in order to increase the yield and reduce the cost of obtaining it. It is impossible to pay dividends and develope a mining property at the same time. It is not true that the people of Aruba will work regularly, and in sufficient numbers if paid in cash or otherwise, whether by the month, week, or day, or even in advance. All methods have been tried by the company. It is very obvious that the Government would not have relaxed the restriction on importing labour if the company had been in fault. The Lieut.-Governor of the island officially stated to his superior Government that the company's complaint against the people was just, and his opinion will be preferred by most people to Mr. Chumaceiro's.

The Aruba Phosphate Company, which was under no restriction as to labour, has been driven to import labourers, though it has paid higher weekly wages than were ever known in Aruba before. No doubt the people are poor, but poverty and idleness often go together, and the late showery season has given the people far better crops than usual, and so enabled them to indulge their constitutional indolence and improvidence in a climate where so little is needed to support life; and so I might go on explaining what is "not true" in Mr. Chumaceiro's letter, if it were worth the trouble to continue it. As regards the Phosphate Company, and the questions Mr. Chumaceiro puts to me, I need only say that he will have the opportunity of hearing the answers that might be given to them in the High Court

if ever he takes the matter into it. Before that tribunal he would have banded against him the Government of the colony, the Aruba Island Gold Mining Company, and the Aruba Phosphate Company; and if he can persuade his employers to face that rather formidable trinity in the law courts so much the better for a "Solicitor at Law." The Aruba Island Gold Mining Company (with a case which seemed invincible) has had bitter experience of the folly of going to law with the colonial Government, and will not be sorry to see Mr. Chumaceiro's employers putting their heads into the same hornet's nest. Mr. Chumaceiro is welcome to fire away as soon as and as much as he can get his employers' assent for. He thinks he will be able to make the colonial Government and its law officers laugh on the wrong side of their mouths, as the saying is. Well, let him try it. I wish I could help him and his employers to strict and impartial justice, for if they got it they would get, in my opinion, much more than they bargained for. A Late Resident in the Colony.

Oct. 5

MINING—PRACTICAL AND THEORETICAL.

Sir,—Your correspondent, "A Practical Miner," in replying to my letter of Sept. 25 has misquoted me in order to strengthen his own bad and feeble cause. I did not use the words "I speak practically" when referring to the use of the pick, for that would have been sheer nonsense; but "I speak from practical experience," that is with regard to the use of that tool. He then misquotes me thus: "Unless the school pupil is unusually stupid he can acquire this simple thing as well as the knowledge of judging of the hardness of the rock and of the price that should be paid for excavating it merely by the occasional school visits to the mines." What I did say was as follows:—"If he is not the dullest of mortals he will soon acquire the use of the pick. Enthusiasm and patience are his best teachers in the use of this tool. After a time—I speak from practical experience—he will be able to feel, as it were, the hardness of different kinds of rock, and know at once from its use the cost per fathom of driving such rocks." I would have your correspondent note that in the passage which follows I speak of the student going underground "from day to day." Misquotation and misrepresentation are very old tricks of anonymous correspondents, but they are miserably shallow and transparent ones, and only weaken the arguments of those who employ them. "A Practical Miner" must be uncommonly shrewd if he can detect from my "phraseology," as he terms it, that I am no miner. If I had talked incoherently of the "classes, shapes, and phases" of mining, "exploring the bowels of the earth," the "quickness of detonators," "a general useful instruction," and "the school theory," he would have rapturously exclaimed "Hail, brother, well met!"

I did not state, nor am I so foolish as to suppose, that the use of the pick is all that is necessary for the mining student. Anyone but your correspondent would have understood from what I said that I merely instanced that tool as an example of what a mining student can acquire by practice.

If your correspondent agrees with me that practical knowledge should be supplemented by theoretical, and theoretical knowledge by practical, then there is no need for further discussion on the subject. But his former letter being a direct attack on theoretical mining, I fear he is not so easily convinced; and if he be bigoted and ignorant a thousand letters will not convince him. If he replies to this I trust he will allow his name to be printed with his letter, and thus bravely and manfully enter the lists. Surely the name of a man who, to use his own words, is "perfectly conversant" with all the school theory, including the weighty matter of mining surveying, in addition to, probably, a larger and more varied practical experience than most men living, is worthy of being known to his contemporaries, and of even being handed down to posterity.

E. Halse, A.R.S.M.

TECHNICAL EDUCATION FOR MINERS, AS APPLIED TO PRACTICAL MINING AND MINE MANAGEMENT.

Sir,—I have noticed of late several letters and remarks published in the Journal on the above subject, about which there seems to be a diversity of opinion. Theory and practice may be represented by a wagon and horses in the possession of a farmer, the wagon representing theory, and practice being represented by the horses. With the two together he can bring in his crops from the fields in a satisfactory manner, with practice—*i.e.*, the horses he could bring them in by packing on their backs, or in some other way, neither would be like the wagon, but with theory—*i.e.*, the wagon only he would cut a very poor shine. So in mining theory and practice work harmoniously together when combined in the one individual; practice works well enough alone in some cases, but theory alone works well nowhere, and is constantly at a dead loss

Can the duties of a commander of a mail steamer be learned in a school? Any shipowner or shipping agent would laugh at such an idea. Whosoever aspires to such a distinctive post has to work hard from their boyhood on board a ship, facing all weathers, and braving every danger, and they not only have to work hard at their duties, but they have also to work hard at their studies, so as to be able to apply theory and practice together. The theoretical part of navigation might just as well be learned in a school as on board ship, but when they came to apply their knowledge to the daily exigencies of a sea voyage they would be just as far at sea as the merest tyro; he has to learn the two together, when he can always rely on the aid of one or the other in case of need; and as one of your correspondents remarked last week, "you might as well put a washerwoman in command" as one who, however skilled in technical seafaring knowledge, but has never learned his duties at sea. And it is on just the same scale to put a theorist and school-learned technical walking dictionary into the management of a mine. When such is done what is to be expected but wreck and ruin. Notwithstanding mineowners will persist in placing in charge of their mines those who can flourish their trumpets, and write reports with a lot of technical terms in them, which nine-tenths of the mineowners themselves do not understand, while at the same time they have not the least idea of practical mining or its requirements; they have not the least idea of the price to be paid for sinking shafts or driving levels, whether a cow or Root's patent blower would be the thing to ventilate a shaft being sunk from surface, whether a bull or donkey engine would be required to pump the water out, whether underhand or back stoping would be most suitable, or whether a winze should be sunk first to drain the water from the shaft, or the shaft sunk first to drain the water from the winze, and in many cases they would have grave doubts as to whether ores should be roasted or given a good crushing, and tied up and sold. Education is really necessary to a mine manager, yet how many may he found in Cornwall at the present time, and how many has there been in the past, who hardly went to school in their lives, but by their own perseverance and study, combined with the practice of their daily life, have risen to places of eminence in the county, and have shown as good administrative ability and theoretical knowledge as the best school-learned technicalists or theorists that may be found, and it is not their faults that Cornish mining does not stand in a higher position to-day as one of the great industries of the kingdom. Is it not to be supposed that the man who has studied theory together with practice, and learned to apply the one to the requirements of the other, is the better man to undertake the management of any undertaking in his line than the mere theorist.

As a student of a mining class in connection with the Miners' Association of Cornwall and Devon, when it was first established there, I appreciate the efforts of those who have laboured hard to make it a success. What I learned there I have found of some benefit to me. However, I think that the scientific information which would be of practical benefit to the working miner would be, or active manager, is not taught there as it should be. Chemical formula, or a long glossary of technical terms are not what the practical miner wants. Technical mining, as taught in the Schools of Mines—I think they should have been named Schools of Mining Chemistry—is about as much good to the practical mine manager as a gold watch and chain and diamond ring would be to a Barbary ape. I do not wish in any way to disparage the knowledge imparted to the students there; to the mine chemist it is, I might say, indispensable, but a mine manager, with his many other duties, has no time to look after or think of these things. I do not mean to say it would do him any harm to know it, but it is not absolutely necessary to him. A mine manager does not especially want to know the peculiarities of the Cainozoic, Mesozoic, or the Palæozoic formations, or anything about the fossils to be found in them; that is a subject which requires more time and study than a mine manager should have to devote to it, so all that may be safely left to the professional geologist. Chemistry as a science is of very little practical use to a mine manager or miner, but to a mine chemist it is indispensable; then why educate a miner in all technicalities of the science? Mineralogy is another science which has its advantages to the miner, but he does not require to know all its technicalities; it belongs to the professional mineralogist, so why occupy a student's time in learning the intricacies of these sciences when there is a great deal that he might learn which would be of much greater benefit to him as a practical mine manager? From the foregoing some will be inclined to imagine that I do not think any knowledge of these sciences beneficial to the mine manager. Such, I can assure you, is not the case, for I have found too much benefit and pleasure from them myself. What I contend is that a mine manager does not necessarily require a technical education; if he has it, and the thoroughly practical as well, he may be all the better man for it, but the time at the disposal of a young miner is not sufficient in which to acquire a technical knowledge which would be beneficial to him; so, I say, teach him anything and everything which might be of use to him in his future calling, but teach it practically, not theoretically and technically, —— Gold not Gilt.

HOME MINES, AND FOREIGN MINES.

Sir,—The above seems to me a very proper title by which to distinguish the competition going on at the present time between the mines at home and those abroad for the greatest share of public favour. Judging from the returns of the Stock Exchange of the business done the foreigners seem to have the best of it, particularly the latest rage—the South Indian gold fields. In trying to get at the cause of this I come to the conclusion that it is merely the realisation of that trite phrase "distance lends enchantment to the view," and nothing more. If the same indications of mineral wealth were discovered—even by the same "prospectors"—within our own little island, and prospectuses were issued in terms and phrases twice as glowing as those found in these South Indian productions, I doubt if it would be possible to rouse up interest sufficient to subscribe a twentieth part of the amount which has so recently been subscribed for the development of this new field of discovery. It would be too near at hand, and consequently with the facilities he would have of satisfying himself by an actual survey there would not be the same chance for the imaginative and hopeful investor or speculator to work himself up to that delightful pitch of excitement and belief which is afforded him by these far distant "specs." I have no desire to disparage the South Indian gold fields. They may turn out all that is anticipated; but, again—having regard to the speech of Mr. Brough Smyth, and the fact that operations have not yet commenced—they may turn out failures. To my mind there is just as much likelihood of the latter as the former.

The Emma Mine bubble, with the puff and bluster of its early days, and its sorry collapse latterly, cannot have long left the lively recollections of some of your readers. There was the same confidence and hopefulness displayed in it at the time as is now shown in these South Indian enterprises. We flatter ourselves that we are a cool-headed, prosaic people in matters of business, yet the Yankees have been able on several occasions to "bounce" us into believing their prospectuses of mineral wealth lying hid amongst their mountains, and only waiting for English capital to be applied in order to extract boundless riches therefrom. What a number of instances could be cited of melancholy disappointment and failure in American enterprises alone commenced and carried on by English capital solely. It might be well to keep a schedule of them for reference as a warning to the rising generation.

Passing from the progressive and bubble foreign mines to the foreign dividend mines I find a similar degree of confidence manifested and preference given by English capitalists to the foreigners. To give an illustration in point I will just refer to the Cape Copper Company on the one hand and Devon Great Consols on the other. These are both copper mines, and both paying dividends, and they would be equally benefited by any advance taking place in the price of copper; but while Cape Copper shares are selling at a price showing a dividend of 9½ per cent. upon the selling price, Devon Great Consols shares are only considered to be worth a price upon which the present dividends show to be at the rate of 15½ per cent., or, in other words, Devon Consols shares can now be bought to show a dividend upon the purchase money 6 per cent. more than can be realised upon Cape Copper. Why should such a difference exist? Surely the old established and extensive Devon Great Consols Mine, having such a manager as Mr. Peter Watson at its head, ought to merit as much confidence of Englishmen as any foreign concern.

I suppose the South Indian mania will have its devotees for a time, but when the excitement connected therewith has subsided, and the consequent reaction sets in, there is no doubt a greater amount of attention will be directed to our home mines. In the meantime I would advise all those who are able to do so with something like a chance of success to transfer their interests from doubtful foreign to sound home mines, and by so doing they will not only be benefiting themselves but their country as well. Observer.

Oct. 6.

MINING ACCOUNTS.

Sir,—With your usual courtesy you have been good enough to allude to some slight effort I have made to induce the directors and committees of mines to issue simple balance-sheets showing receipts and payments and liabilities and assets up to the latest date, and to work on the no credit system. I have not done more in this matter than I have been compelled to do, fearing that my remarks might bear a different construction to that which was intended. Obviously I was not too cautious, for it now appears that the managers of our celebrated mines are even at this hour assailed because in the dark days of 1878 and 1879 they allowed heavy debit balances to accumulate. It is very ingenuous to hide your defects by assailing other people, and I can conceive of no creditable motive for arraigning managers and pursers for the policy they pursued at a time when shareholders were panic stricken, and when it was impossible to collect calls even if they were made. There is in every Englishman an inherent love for fair play, and sooner or latter this passion is certain to assert itself, and the time has come for the criticism to which I refer to be disposed of. Nothing has ever given me more confidence than the manner in which our large mines have been managed for the past 20 years, and especially in times of depression and panic. Banks have collapsed. Firms of long standing have succumbed, frauds here there and everywhere have been reported, but not in one single instance has fraud been traced to our mine managers, and not in a single case, as far as I know, has a mine collapsed by bad management or by bankruptcy True small concerns have imperceptibly in the general gloom disappeared with trifling losses to the holders, and no doubt insignificant and unsound companies have been forced into the Stannaries Court, but never has one mine of first-class standing been compelled to wind-up or been found to be entangled by fraudulent transactions. Need I mention the mines to which reference is made to prove my point? Surely not. They will occur to every man of any lengthened experience. But, nevertheless, it is against these concerns, and these only, that cynical remarks are being made. And why? Simply because when most unquestionably they were in difficulties the committees on their own personal responsibility borrowed money, continued energetic operations, and made no calls. It was by this action that the mines were saved. There was I grant concealment, but it was concealment at the risk of the managers, as it turned out—and as they knew it would turn out—entirely to the advantage of the shareholders. If in a like emergency Cornwall is able again to produce men to carry mining enterprise on under such conditions it will again stand alone amongst all the counties in England in producing men of such consummate common sense, and of such courageous and disinterested motives. But, Sir, no such crisis ought again to be possible after past lessons. In making this admission let me say that the editor of the West Briton should be commended because of his efforts to prevent in the future such a crisis. The dark days of the past are gone, but the lessons should never be forgotten. These managers, in whose praise it is difficult to speak too highly, should now, and at once, enter all their accounts up close, so that any ordinary man can understand them. Now, at any rate, there should be no concealment. Now, at any rate, all debts should be paid, and the "no credit system" should be adopted. There should go forth one unanimous declaration from shareholders in mines that, as to be out of debt is to be out of danger, there shall be no debt. Where debt exists let calls be made to pay it off. I hope that the spirit in which I have again approached this subject can only be spoken of as a friendly spirit, and I know that these sentiments are the sentiments of 80 per cent. of investors in British mines. Mining is rising in public favour. In order that confidence may be still further increased let the right principles be adopted in a spirit worthy of the age and of the enterprise. Let "one and all" remember that "what is right is best—best for the individual, and best for the community."

Walbrook, London, Oct. 7. —— John B. Reynolds.

WHEAL PEEVOR, AND WEST KITTY.

Sir,—At the New Kitty meeting Mr. F. W. Michell is reported to have said that he was not quite sure that Wheal Peevor and West Kitty were not two of the best speculations in Cornwall, and that his hearers might with equal confidence advise people to go into either of them or into New Kitty, &c., &c. I wish to correct an error. Mr. Michell did not allude to Wheal Peevor at all, but to West Peevor, which is situated to Wheal Peevor exactly as West Kitty is situated to Wheal Kitty. Comparisons have been made as to the market value of West Peevor and West Kitty. It must be remembered, however, that West Peevor is only in 3000 shares, and that West Kitty is in 6000. It will not be stated that West Peevor is selling at too high a price, with its shares at 15*l.*, and admitting both mines to be of about equal merit no surprise need be expressed that it has been found difficult, if not impossible, to execute the buying orders for West Kitty's during even this week of stagnation. Further, if now you can sell any number of West Peevor and West Kitty at quoted prices, let me ask what will the shares fetch when profits are divided, which, in both mines, it is alleged is only a question of a little time? If any one doubts, let him read the proceedings of the New Kitty meeting in last week's Journal, and he will soon be convinced. In conclusion, I think that if 1000 West Kitty could be obtained at 3*l.* each, they would be taken. It is only fair to the shareholders that these facts should be known.

London, Oct. 8. —— John B. Reynolds.

CHEAP SHARES—PENHALLS.

Sir,—By dint of assiduous puffing we see shares in new mines and non-dividend old ones quoted above those in dividend concerns. Why on earth, for instance, should West Kitty shares be worth more than Penhalls ditto. I will say nothing against West Kitty's. It may be that all the treasures of Golconda will be found in that mine ultimately, but meanwhile the undertaking returns nothing but losses, necessitating calls every time the adventurers meet, and yet the shares are quoted above 2*l.* each. Now, Penhalls is an old mine. No puffing is required to prove its value. Figures alone will show that conclusively. According to the last report, read at the meeting of shareholders September 17, about 49 tons of tin were sold in three months for 2448*l.* The net profit for those three months was 182*l.*, and out of an available balance of 558*l.* 15s. 4d. a dividend of 2s. per share was declared. Despite all this the shares can be bought under 2*l.*; that is to say, at less price than West Kitty's. Again, I see Wheal Uny shares considerably above Penhalls, and also with no show of reason. Wheal Uny Mine is well known as a losing concern, and some of its shareholders even talk of throwing it up altogether. I know no other dividend mine so cheap as Penhalls, and the price should rapidly improve to a more reasonable level than the present

Vigilans.

TANKERVILLE MINING COMPANY

Sir,—I hope some one will answer the question of your correspondent in last week's Journal, for I consider that everything depends on Capt. Waters having the management of the new company, London managers, managing directors, and speechifying chairman, may be very well in London, but the success of the mine depends on the practical man on the spot, who directs and superintends the operations. He ought to be a man of energy, ability, judgment, and honesty, all of which are fortunately combined in Capt. Waters. If he manages the mines for the new company our directors (either with or without a chairman) need attend to nothing else but the finances.—*Oct.* 6. —— An Old Shareholder.

CAMBORNE—ITS MINES, &c.

Sir,—In my last letter I named nearly all the mines in this celebrated parish, but I omitted Camborne Consols—a sett which included all the late Sir R. Vyvyan's part of the town. The workings were near Stray Park, but were very limited in extent. The late Capt. James Vivian was the agent. I used to meet the late Mr. F. Daniell there frequently. I think that he held some office in connection with the mine. Crane and Bejawsa Mines United were at work in the year 1850, just then set on. I remember the amusement occasioned by the finding of a trout in the engine-shaft, which people said had been there fattening on the mineral (copper) water. The late W. Lanyon lost a large sum here. About 500*l.* were spent in account houses, &c., which are now cottages belonging to Mr Basset. Violet Seton is a little mine, a sett of which was firstly taken up by the Mr. John Rule, of Parc Brackett, Camborne, but little was done in his time. I understand that recently an engine has been erected, but I know nothing of the company or its agents. A little mine situate in the Berripper Valley, and a mile north of that village, was slightly worked about 40 years ago, the name of which (having no map at hand) I cannot state. The farm and mill are called Nasmellyn—Mr. Basset's property.

My first knowledge of Camborne was in 1818 or 1819, when the population of the town was about 300 or 400, now it is between 6000 and 7000. Tuckingmill contained about 10 houses, now about 500. Trewoon (locally Troon) contained about an equal number, now about 200. Beacon was a hamlet, now a large village. Nothing but mining in the district accounts for such an amazing increase. Up to about the year 1830 the way from Helston to Redruth was down Cross-street, by the hotel (than kept by Mr. Wm. Burgess), through Fore-street, near Rosewarne House—by Wheal Gerry (now a part of North Roskear), by South Roskear engine, to a point in Tuckingmill, opposite the present foundry of Messrs. Bickford, Smith, and Co. The way to Penzance was by the same road from Tuckingmill, so far as Rosewarne western corner, whence it took its course through Treswithian Village to Roseworthy, &c. Now the communications are direct to all places by the opening of Pendarves-street, in Tuckingmill, and Centenary-road, Trelowaren-street, and Church-road, in Camborne.

No town in the county of Cornwall can be instanced as having increased in size and population like Camborne in the same period. Rosewarne was the property of Wm. Harris, Esq., with other extensive estates in Cornwall (worth about 5000*l.* per annum) up to his death, about the year 1823. He built the residence there and planted the surrounding grounds shortly before his death. I remember passing by when the house was completely exposed to view from the road; now nothing of it can be seen therefrom. Mr. Harris was the purser of several mines, amongst the rest of Wheal Abraham, &c., and Mr. Robert Bennett was his confidential clerk. Upon Mr. Harris's decease the estates descended to his daughter, who had married a Mr. Winchcombe Henry Hartley. There was issue one son, the present proprietor—a lunatic, like his mother, who was burnt in her bedroom at Rosewarne. The marriage was an unhappy one, and a separation took place, Mrs. Hartley allowing her husband 900*l.* per annum for life. Mr. Harris's father, or grandfather, entertained the Rev. John Wesley on his visits to Camborne. Cotemporary with Mr. Harris was Capt. A. Vivian, the manager of Wheal Abraham and other mines; also Mr. Woolf, the engineer; Mr. Petherick, the manager of Dolcoath, who said that "there was not copper ore enough in the district south of Carnbrea Hill to make a penny." Since his day about 3,000,000*l.* have been sent to market from Wheal Basset,

Wheal Buller, East Basset, North Basset, West Basset, and South Frances. He was too hasty in his conclusion. Another cotemporary with the men of those days was Mr. R. Trevithick, the inventor of the locomotive steam-engine. The late Capt. J. Vivian told me that he saw it tried and at work about the year 1807 or 1808. It will be useless to controvert the fact of his invention. He was a native of Camborne and an extraordinary genius. He undertook and executed some important works.

Camborne and Illogan (adjoining) are the only parishes in Cornwall not seriously affected by the late distress. Very few of the mines ceased, although some of them incurred heavy liabilities during the depression, all of which have been discharged since. The companies showed great pluck in holding on. R. Symons.

Truro, Oct. 4.

EAST WHEAL ROSE.

Sir,—Finding that some highly respectable and influential gentlemen have undertaken the resuscitation of East Wheal Rose, I should like to state a few facts respecting it. It is situate in the parish of Newlyn East, about eight miles north of Truro. It was the richest lead mine ever known in Cornwall, having yielded to the shareholders in 13 years—viz., from 1840 to 1852 inclusive—278,528*l.* profit. Every shareholder who held his interest throughout that period received in dividends 2176*l.* for every 50*l.* laid out. As a rule mines are abandoned because of exhaustion (real or supposed) of their metallic resources. This mine is one of the exceptions from that rule, the bottom level—the 150—being as rich as any level ever was above. The stopping of the mine may be attributed, mediately, to an accident—a waterspout which deluged the mine in 1847, and, immediately, to the misapplication of the capital (30,000*l.*) raised by the late Mr. Henry Borrow for the purchase and working of the property. The manager under him, Capt. John Nancarrow, resolved to do an almost impossible thing—viz., to sink Michells' shaft on the course of the lode—like sinking through sand. The attempt cost 600*l.* per month, and after 11 months' trial the result was a sinking of only 1 fathom and 5 feet. The capital having been injudiciously misapplied abandonment was the consequence. Borrow and Co. held the mine less than three years. This occurred about 25 years ago, leaving enormous reserves of silver-lead ore in store for those who are now come into possession of the property. I have been making very particular enquiries, on the spot and elsewhere, into all the circumstances in relation to the mine, the extent of sett, number of lodes, &c., and I find the following to be facts:—

The sett—which is in the land of Messrs. Hawkins and others—is about 1¼ mile in length and three-quarters of a mile broad. The lodes which yielded most of the wealth are the two following—viz., East lode, northerly strike, worked to a depth of 150 fathoms from surface, and for a length of 425 fathoms; and Middleton's lode (west of East lode and parallel therewith), worked to same depth and length. There is a distance from Penrose's shaft, on East lode, to the southern extremity of the sett, of 375 fathoms to be developed; and on Middleton's lode 400 fathoms to same boundary; believed to be as rich as the wrought parts on same lodes north of that shaft, whence the riches were derived. In addition to those two lodes there are the following to be operated upon: Shepherd's lode, easterly strike. It was found rich for lead as far as the operations extended, a depth of only 50 fathoms, and that for a short length. Great caunter lode (lead and blende), north-westerly strike. Nothing done except at adit. Length in sett 600 fathoms. Rich specimens of lode to be seen near Penrose shaft; Long's lode, north-westerly strike, 700 fathoms in sett. Cut only at Roberts's shaft, at 40 level. Lode kindly; Perran iron lode. The great lode now being wrought at Treamble and other places, by Messrs. Roebuck and Co., passes through this sett for a length of 800 fathoms; produce of ore about 45 per cent. of metal.

Very few sections of lodes show such uniform productiveness as those presented by the East and Middleton's lodes, from the 20 to the 150 (bottom) level; and it is highly probable that the same character will continue 150 fathoms deeper, and thus give as great profits as were given in the past, in addition to the profits which may be expected from the above-mentioned lodes unwrought, and from all the southern unexplored portions of the East and Middleton's lodes.

The presence of a branch of the Cornwall Minerals Railway in the sett is of considerable importance, because it connects Newquay, distant five miles, with the mine, rendering transit of supplies and produce easy, cheap, and expeditious. The future working of the mine can be conducted on a much cheaper scale than that of the old. There were then three pumping-engines. What is now required, in the first instance, is a 90-in. pumping-engine on Penrose's shaft, which will drain the mine to the 110 level. After that, an 80-in-engine at Oxnam's will be sufficient to go to a 250 level. Of course there must be steam whims and other appliances. A guaranteed capital of 50,000*l.* (limited) will be ample; but it need not be all called up. One-half paid up will justify instant active proceedings. Returns of ore will soon help the cost. The evidence of scores of persons who know the mine might be obtained in support of my opinion as to the value of the property; but I will mention only three, who may be consulted (if thought needful)—viz., Capt. Skewis, of Tavistock; Capt. G. E. Tremayne, of Scorrier; and Capt. T. Doidge, of Shepherd's Newlyn, near Grampound Road—men whose veracity none can impeach. Shepherd's and South Shepherd's, mines at the West, yielded very considerable profits to Sir C. Hawkins and others, and are about to be re-opened, all legal obstacles being removed.

Truro, Oct. 6. R. Symons,
Land and Mineral Surveyor.

MORFA DU MINE.

Sir,—I am glad to see in last week's Journal that some one had at last began to make enquiries into the management of this concern, for after the promises that the mine would be a paying one I, like your Correspondent, was very much surprised to find that more capital was required to carry it on. If the present directors are incompetent, why do not the large shareholders call a meeting and appoint others in their stead, as the mine from report evidently only requires business tact and ability to make it a dividend-paying concern, and it seems a pity the money of the shareholders should be squandered to no purpose when by a little energy and discretion it might be made to pay handsome dividends. A Shareholder.

History of Tin Mining in Bohemia and Saxony.—The interesting and exhaustive paper upon this subject contributed to the Oesterreichischen Zeitschrift für Berg-und Hüttenwesen, by Dr. Eduard Reyer, of Vienna, has just been separately reprinted in pamphlet form. The history commences at the end of the twelfth century, and it appears that in 1241 the fame of the rich Bohemian tin ore had reached England. Dr. Reyer gives among other things a valuable table of the prices of tin in Bohemia and in Saxony from 1479 to 1872, the earlier portion being taken from a manuscript in the Library of the University of Prague, and the continuation from original data found in the archieves of Dresden, Freiberg, Platten, and Schlackenwald. From seven Rheinish florins per centner (cwt.) in 1479 prices advanced pretty gradually in Bohemia until 1816, when they reached 225 fl. to 236 fl., falling to 50 fl. to 60 fl. in 1866, and recovering to 98 fl. to 105 fl. in 1872. The fluctuations in Saxony do not appear to have been so great. The tin production of Austria and Saxony has declined, the former from 12,000 to 500 centners, and the latter from 8000 to 2000 centners, the combined decline from 20,000 centners in 1500 to 2500 centners in 1850. The produce of the ore does not seem to have materially varied, ranging between ¼ and ½ per cent., and the schlich giving from 50 to 60 per cent. of metal. There is one rich lode near Graupen which yields 3 per cent. of tin. The pamphlet, which is published by the author, can be obtained in this country through Messrs. Trübner and Co., Ludgate Hill, contains many references to early tin mining regulations, the first printed for Altenberg being in 1568, and there is much useful information both with regard to Altenberg and Schlackenwald. The entire paper appears to have been prepared with much care and judgment, and must have involved a large amount of labour and research.

Meetings of Public Companies.

REVIVAL OF MINING IN THE TAVISTOCK DISTRICT.

STARTING OF DEVON GREAT UNITED MINE.

On Wednesday last, in presence of a large and representative gathering of shareholders from all parts of the country, the pumping engine at Devon Great United Mines was set to work. The mine, which is partly in Devonshire and partly in Cornwall (the River Tamar running through the sett), adjoins the Devon Great Consols, and will be worked under a board comprising most of the directors of that celebrated mine. Formerly, the mine was worked with great success as the West Maria and Wheal Fortescue, and during the nine or ten years that operations were carried on proved highly productive and profitable, over 45,000*l.* worth of copper, arsenic, lead, and tin being raised. In order to develope the mine to the west of Devon Great Consols a shaft was sunk to the 60 fm. level, and a cross-cut was driven at the 40 and another on the 50 fathom. At the 40 the cross-cut intersected the north lode, and very rich ore was discovered, which was valued at from 40*l.* to 60*l.* per fathom. As the lode inclined eastward it was deemed desirable to sink a shaft between the 30 and 40, and almost immediately a course of ore, running from Mr. Willesford's land to Earl Fortescue's, was struck. Unfortunately, some dispute arose between the lords and the adventurers, the chief point of difference being with regard to a demand made by the lord on whose ground the ore was struck, who claimed a premium on all ore which came to the mouth of the pit from levels in the other ground. This claim was resisted by the directors, and the difference culminated in law proceedings, and whilst these were proceeding operations were suspended. Although the workings were stopped, and the mine virtually abandoned, the purser of Devon Great Consols, Mr. Moses Bawden, knowing the value of the mine, interested himself, with some other influential gentlemen, in bringing the mine to the notice of the public; and when the law proceedings terminated, and all difficulties were removed, arrangements were made to re-open the mine, taking in Wheal William, another mine adjoining Wheal Maria and Wheal Fortescue, and separated only by the River Tamar. There was a considerable amount of valuable machinery on the mine at the time it was abandoned, and there has been little or no outlay in the providing of fresh plant and machinery. The capital of the new company consists of 20,480, shares of 2*l.* each, of which 1*l.* per share has been called up. Mr. Peter Watson, chairman of the Devon Great Consols, is the chairman, and Mr. Moses Bawden, purser of Devon Great Consols, is to be purser, and Capt. Isaac Richards, manager of the same celebrated mine, is to be the manager of the resuscitated undertaking.

The hour fixed for starting the engine was one o'clock, but for two or three hours previous to that time the visitors, under the guidance of Mr. Moses Bawden and Capt. Richards, walked over and examined, as far as such a vast property could be examined in so short a time, the works and operations of Devon Great Consols. The shafts, the dressing floors, the blacksmiths', carpenters', and coopers' shops' were visited, and some of the party proceeded to the well arranged and well managed foundry, where the heavy portions of the machinery are cast. The large works where the arsenic is treated was a point of particular attraction, and the lucid explanation of the processes by which the arsenic is transformed from the crude to a refined state was listened to with great attention. The copper precipitate works were also inspected with special interest. At these works the water from the upper works, apparently pure, but in reality considerably impregnated with copper, is now made to pass over pieces of old iron, the result being that the copper held in solution in the water is deposited, and the effluent water flows off to the River Tamar in a comparatively pure state. These precipitate works were evidently a surprise to most of the shareholders; indeed, it may safely be said that the great majority of the shareholders had no previous knowledge or conception of the vast magnitude of the enterprise in which they are interested. Expressions of pleasure and surprise were to be heard on all sides as Mr. Bawden and Capt. Richards described the miles upon miles of underground workings, the immense length of the pumping-rods, the miles of railway and tramway, and the almost army of labourers engaged in carrying on the works.

A few minutes previous to one o'clock the party assembled in the counting-house adjoining the engine-house. Amongst those present were—Mr. Peter Watson, chairman of directors; the Right Hon. Lord Claude Hamilton, a director; Mr. S. Morris, Mr. H. R. Trehern, directors of Devon Great Consols and Devon Great United Mines; Mr. S. York, director of Great United Mine; General Colin Cookworthy, Rev. W. Symons, Gulworthy; Mr. H Clark, Mr. H. C. Stewart, Mr. M. Bawden, agent for the Devon Great Consols and Devon United; Capt. Matthews, Mr. T. W. Greenfield, Mr. S. Richards, portreeve of Tavistock; Mr. W. Matthews, Mr. Francis, Mr. S. Berry, Capt. Arthur Waters, Shrewsbury; Mr. St. Alphonse, Capt. Isaac Richards, Rev. J. D. Watherston, Mr. E. Acland Moore, Mr. J. A. Page, Mr. G. H. Barber, solicitor; Mr. H. Wilson, Mr. J. Green, Mr. H. Bentley, Mr. Martin, Mr. W. H. Allen, secretary, and other gentlemen. The ladies present were Mrs. Peter Watson, Mrs. M. Bawden, Mrs. York, Mrs. G. H. Barber, Mrs. Symons, Mrs. Triscott, Mrs. T. Richards, Mrs. Greenfield, the Hon. Miss Smale, Miss York, and Miss Chubb.

Mr. Peter Watson said he would ask the indulgence of those present whilst he made one or two remarks regarding the object for which they were assembled, which was to start the engine for the purpose of developing the lode or lodes of great wealth—lodes which had been enormously wealthy in the adjoining mine of Devon Great Consols. He and those associated with him believed that the development of Devon Great United would result in handsome returns to those who had invested their money in it. (Cheers.) He pointed out that in prosecuting this great enterprise they were only doing that which he believed would well repay those who had invested their money in it, bnt they were also greatly benefiting the district. It had been his great object and aim ever since he had been connected with the Tavistock district to do his very utmost not only to make good returns to the shareholders, but also to benefit the working miners, and that would continue to be his aim, and also that of the other directors who were associated with him on the board. (Cheers.) Without detaining them any longer he would call upon the purser, Mr. Moses Bawden, who knew more about the mines of the district than any man, to explain the position of the mine at the time operations were suspended, and also what is proposed to be done with regard to future workings.

Mr. Moses Bawden said he fully endorsed all the observations which Mr. Peter Watson had made regarding the great promise of future success in connection with the Devon Great United Mines. By means of a model he explained the position of the mine in relation to the mines in the immediate vicinity, and pointed out that the lodes in Devon Great Consols ran directly into the sett. He spoke of the great value of these lodes, and explained the reason why it was stopped, but as the more important of these particulars are embodied in the introductory paragraph above, it is unnecessary to repeat them here.

A Shareholder asked why the mine was abandoned?——Mr. Moses Bawden said chiefly from the dispute with the lords, and not from any want of good ore.

Mr. Greenfield: As one of the shareholders in the old mine, I may say that the mine did not stop from want of metal. The mine stopped for two reasons—first, owing to what the shareholders considered illiberal treatment on the part of the landlords, and also in consequence of a time of depression setting in. The mine, therefore, fell through, but that there was plenty of metal was never questioned. (Hear, hear.)

A Shareholder, in reply to a question as to whether there was likely to be any further difficulties with the lords, Mr. Moses Bawden said he had received letters from the representatives of two of the lords wishing the mine every success.

The party then proceeded to the engine-house, where everything was prepared for the important proceeding of the day. The weather was not quite so fine as could be wished, the day being dull, and a Devonshire drizzle falling at times, but without any appreciable effect upon the spirits of the party.

Before presenting the bottle of wine to Mrs. Peter Watson, by whom the ceremony of christening was to be performed, Lord Claude Hamilton said on behalf of the company he thanked those present for their attendance that day in spite of the unfavourable weather, and expressed his pleasure at seeing them there in such large numbers. They were met, as Milton said, "Joined in equal hope and hazard in this glorious enterprise." Theirs were not mere expectations and vain anticipations of results, but their hopes were based on the calculations of the most experienced and most competent men in this country. They were based upon the past works, which had been less favourable than the present promised to be; therefore, he thought they had ample ground for hope. With regard to the hazard, they knew that mining operations were subject to great vicissitudes, but in this case the reputation of the men who had advised the undertaking knew what they were doing. The directors had received advice and counsel from the most experienced men, and, therefore, he thought the hazards were infinitesimal, and he hoped great results would come of the undertaking. He regretted being unable to congratulate them on being favoured with the sun, but still they had the presence of the ladies, and their smiles and good humour were more constant than the sun in this variable climate. (Applause.) His lordship then invited the spectators to witness the operation about to be performed by Mrs. Peter Watson.

The pumping-engine was then set to work, and water having been brought to grass, Mrs. Peter Watson, amid loud cheers, smashed the bottle of wine against the piston-rod, and in christening the engine said: "My Lord, ladies, and gentlemen,—I have much pleasure in christening this engine 'Watson's Engine,' and hope it may be the means of obtaining good dividends for the shareholders." Loud cheers were then given for Mr. Peter Watson and Mrs. Peter Watson; and Mr. Watson, Mr. Bawden, Mr. Matthews, and Capt. Richards were warmly congratulated on the efficient manner in which the engine had started work.

Mr. Peter Watson, amidst much cheering, said that those employed—miners and workmen—will share in the festivities of the occasion, it having been arranged to entertain them at dinner on Saturday, on the conclusion of the day's work.

After the ceremony of christening the engine was over the party proceeded to the counting-house of the Devon Great Consols, where dinner was provided.—Mr. Peter Watson presided.

The cloth having been removed, the Chairman gave the toast of "Her Gracious Majesty the Queen." He said he was sure all present would join in the earnest wish that her Majesty may long be spared to reign over us.

The toast was received with loud cheers. "God Save the Queen" was sung.

The Chairman next proposed the "Prince and Princess of Wales, and the rest of the Royal Family." He (the Chairman) then gave "The Army, Navy, and Reserve Forces." In proposing the toast the Chairman briefly referred to the recent glorious success of General Roberts, and said he was sure that when the other branches of the service were called upon to do their duty they would not be found wanting. He coupled with the toast the names of General Colin Cookworthy and Capt. James Mathews.

General Colin Cookworthy and Capt. Mathews acknowledged the compliment.

The Chairman, amidst loud cheers, next proposed "Success to the Devon Great United, and Success also to the Engine." In giving the toast the Chairman said—It is rather singular that my wife tells me that when she goes shopping she sticks to the old shops; she says success generally follows. I can only hope that this may be the case to-day. She has been to the shop to-day, and through her instrumentality in christening this engine, and from the kind remarks of Lord Claude Hamilton, I hope we shall have a great success for the Devon United Mines. (Loud Cheers.) I do not hesitate to say that neither in Devonshire nor Cornwall, nor anywhere else, is there a more promising mine, nor a more legitimate mining enterprise than this mine, situated, as it is, immediately adjoining a great and valuable property. (Hear, hear.) I do not wish to add much to what I had the pleasure of saying at the mine to-day, because in some measure it may be occupying your time unnecessarily ("No, no"); but I think the attention of the shareholders cannot be too much fixed on the fact that the lodes come into this mine from the adjoining mine of Devon Great Consols, from which such enormous wealth has been obtained, and where such wonderful discoveries have taken place—discoveries which have never been equalled in this country, and perhaps never equalled in the world. (Loud cheers.) These lodes in the Devon Great Consols to which I have referred, are situated within a stone's throw of our engine, have, in years gone by, produced such enormous returns, that in 1844, by the expenditure of 1000*l.*, the shares of 1*l.* each had, within the period of 12 or 18 months, risen in value to 800*l.* per share—that is to say, the capital of 1000*l.* had risen in valuee to 800,000*l.* (Cheers.) Now there is nothing in this country, there is nothing in the history of mining, which shows anything to equal that. (Hear, hear.) But you must remember that, apart from any amount which has been divided amongst the shareholders, no less than between 400,000*l.* and 500,000*l.* has been expended at surface or underground, all of which has been paid for out of revenue—that is to say, out of profits. (Cheers.) The very house we are assembled in, all the buildings you have seen on the mine, the machinery, and, in fact, everything on and about the Devon Great Consols Mine, has been paid for out of profits, and in addition to that a sum of no less than 1,200,000*l.* has been paid to the shareholders in the shape of dividends. (Loud cheers.) All this has been done from the lodes in the Devon Great Consols. Now I am not going to hold out to you any hope that such grand results will be achieved in the Devon Great United; but still history does repeat itself, and may repeat itself in connection with this mine, and for all we can tell it may repeat itself on a similar scale. (Hear, hear.) But whatever may be the result, whether there be a profit to the shareholders, or whether there be a loss to the shareholders, I can only say this, that I can vouch for our worthy purser, Mr. Moses Bawden, for our able manager, Capt. Isaac Richards, for all the heads of departments—in a word, for every one connected with the mine, that they will put their shoulders to the wheel, and do all that lies in their power to obtain success. Of course we cannot command success: we do not always obtain that which we desire, but at any rate we shall endeavour to do our duty, and do our very utmost to bring this great and promising undertaking to a successful and profitable issue. (Loud cheers.) But you must not go away with the idea that the results which we hope to obtain, and which we believe we shall obtain, can be brought about immediately. I see at the present time there is a great deal of clamour about certain mines, and a great running after them on the part of a section of the public, and perhaps a word of caution may not be out of place on this subject. I have seen the same thing in California and elsewhere. Too many people put their money into a mine to-day in the hope of receiving large dividends in a week, a month, or a year. Well, gentlemen, so far as a week, a month, or a year are concerned, all I can say to those gentlemen who go into mining speculation with such an idea as that is that they had better keep their money in their pockets. (Cheers.) That is not legitimate mining at all. What we want is capital to put into a mine to develope it, in the same way that you put your money into a railway. It takes time to make a railway, but you make it in the hope that it will bring in revenue—that it will bring in grist to the mill. (Hear, hear.) But I am sorry to say that it is not always the case with mining. There are a large number of speculators who go in for mining more as a means of gambling than legitimate enterprise, and it is against this that I would enter my earnest protest. If men go into mining let them go into it as a legitimate enterprise, in the same way that they go into railway or any other industrial or mercantile pursuit. (Cheers.) I hope and trust that shareholders in the Devon Great United, or in any other mine with which I am associated, will never come into a mine with that spirit. (Hear, hear.) I am proud to think that in Devon Great United we have one of the best list of shareholders we have ever seen in this country—men who have put money in for investment, and not for mere speculative gambling. (Hear, hear.) We number amongst our list of shareholders gentlemen who were shareholders in Devon Great Consols 10, 15, 20, and 25 years ago; I am extremely pleased to see some of them present to-day, and am proud to think they take an interest in this undertaking as a sound and legitimate enterprize. I am also proud to think we have many lady shareholders, several of whom I am happy to see are present. There are a large number of lady shareholders still coming in, and I am very glad to see that they are coming in. Now let me give lady shareholders a word of warning, and that is that they should weigh and consider well before they part with their money into mining affairs which are carried on in foreign climes. (Hear, hear.) I have said for many years, and I say it more earnestly and sincerely at this time than ever before, that there are as good mines to be found for investment in and around Kitt's Hill as are to be found in any foreign country. (Cheers.) I and my family have been associated with mining and similar works around Kitt's Hill for over 75 years, and, therefore, when I speak on this subject I speak of a subject which I know and understand (hear, hear), and I can only repeat what I have said on many previous occasions, that if people would only invest their money in mining operations which are properly carried out in the vicinity of Kitt's Hill, they would find that there is no better investment for their money either in this country or abroad. (Loud Cheers.) As I have said, I and my family have been for a very long time associated with this district, and I am desirous not only of promoting the interest of those who have invested money in these enterprises, but also earnestly desirous of doing everything which can be of benefit to the miners and others connected with mining pursuits. (Hear, hear.) I am afraid I have occupied your time on the present occasion too long, and, therefore, I will simply conclude by asking you to drink success to the Devon Great United, to the engine which we have seen so successfully started to-day, and also to our agents and everyone associated with the mine, and I will ask our worthy purser, Mr. Moses Bawden, to acknowledge the toast. (Loud and continued cheering.)

The toast was drank with great enthusiasm.

Mr. Moses Bawden (the purser) was very cordially received on rising to respond. He said: My lord, ladies and gentlemen, it affords me very much pleasure to return thanks for my foundling, for I look upon the Devon Great United as a child of my own. (Hear, hear.) There was a time when mining was looking very much depressed in this district, and in consequence of this the mine suspended operations for a short time. I had then a very heavy stake in it, and, although the other persons connected with it said they would go out of it, I at once said I would take up the lease, and went the very next morning and did so. (Hear, hear.) I held this lease in conjunction with Mr. Mathews, until you, Mr. Chairman, were kind enough to come forward and assist me in bringing it to what we have seen to-day. (Cheers.) Our worthy Chairman has acted very much in the same way that another chairman once acted to a very eminent lecturer. This eminent lecturer was about to give a lecture, and a very notable individual was appointed chairman. This notable individual came furnished with a long history of the life of the man regarding whom the lecture was to be given, and in introducing the lecturer gave a somewhat full epitome of the life of the man, so that when the lecturer came forward to give his lecture he stated he had little to say, as the history which he had to give had been been taken from him by the chairman. (A laugh.) Well, now, that is very much my position on the present occasion, inasmuch as our worthy Chairman has said so much that there is really very little left for me to say, but I will make one or two remarks. We are now, as Mr. Watson has pointed out, situated on what may be called the Queen of Mines, for there is no mine in the kingdom—and I may almost say out of it—that has such an extent of workings as Devon Great Consols. (Hear, hear.) The workings of Devon Great Consols as they at present exist are almost equal in length to those of Carn Brea, Tincroft, Cook's Kitchen, and Dolcoath Mines put together. The Devon Great United is situated at the extreme western point of this great undertaking, and I have no hesitation in saying that had the workings been carried on to the east I have not the least doubt that the result from the working would have been almost equal to what they were on the other end. I was speaking to-day with Lord Claude Hamilton, and I was mentioning to him that if we look for mineral veins we must look within a certain distance of certain specifications. I allude to the granite range which runs through this county and Cornwall. You may go to the extreme point of Cornwall, and take Botallack; then you may come further inland, and go through the Redruth district, and you find within a certain range that you have certain ore-bearing land. Then you go through St. Austell, and thence on by the range of hills to Kitt Hill, and round to the English Channel, and if you want to do fair mining you must keep within a certain distance of this stratification. (Hear, hear.) We are happily situated just as the rich mines are in the West of Cornwall. This district I look upon very much as the West Cornwall was some sixty years ago. Then it was considered an impossibility to raise a stone of ore to the east of Truro. My father was the first man who had to do with mining to the east of Truro. He was agent to Mr. Stainsby, Mr. Peter Watson's uncle, and he opened up a mine on the east side called South Dolcoath, and when he had gone about 100 fms. or more east he struck into rich ore. Mr. Bawden went on to refer to several other mines in the same district of Cornwall, which had been opened up in the belief that the same lode or lodes would be opened as had proved so rich in the South Dolcoath. As he had said, he looked upon this Tavistock district as like a baby in long clothes, and he hoped one day it would be able to walk, and then to run alone. The old Drakewalls on the other side of the river had been working for a century and a-half, and a little nearer still was the Gunnislake (Clitters), now developing into one of the richest mines in the district. Then there was the Bedford United, which had given 70,000*l.* in dividends, and there was the Hingston Downs, where the returns had been a quarter of a million. He went on to refer to other mines, and pointed out that all these were within a certain range of the stratification to which he had alluded: he again drew attention to the admirable position of the Devon Great United in relation to the well known rich lodes in the Devon Great Consols, and expressed his hope and firm belief that the Devon Great United will develope into a productive and profitable mine. (Cheers.)

The Chairman: I am sure we are all very much pleased with the observations which has fallen from Mr. Bawden, for there is no man who knows more about the mine, or who has the interest of the company more at heart. I have now great pleasure in proposing "Success to the Sister Mine—the Devon Great Consols." (Cheers.) I will not detain you long, but I will read a few details which will give you an idea of the magnitude of the operations carried on there. We have 12 shafts on this Devon Great Consols Mine; 1724 fms. of pitwork in the course of working, and two man-engines at work. The length of drivages in this mine is 36,106 fms., or 41 miles of levels underground. Our length of tramway underground is upwards of 5½ miles; our steam-engines are ten in number. There are 11 large wheels for pumping and hauling, and several smaller ones for other purposes. Our length of rods, which you have seen, is 2420 fms.; we have a railway to take our ore down and bring up the coal and coke and so forth, and I may mention in passing that if it were not for that railway I do not think that Devon Great Consols would exist at the present time. In addition, we have had 20,000*l.* to pay for a piece of ground, from which we hope to have some reward shortly. We have 5 miles of railway from the arsenic-works to Morewellham floors, and another mile of railway for conveying stuff from the new shaft to the main dressing-floors at Wheal Anna Maria. We have two locomotive engines, and I can only hope that on the next occasion of your visit we may have more propitous weather, so that Capt. Richards may take you in what we call our saloon carriage over the line to Morewellham. I do not know a more charming view. Then we have 60 ore and timber wagons; the inclined planes from the main line to different parts of the mine measure 549 fms., and there are 443 fms. of ordinary inclined planes on the surface. The length of tramways on the surface of the dressing is 250 fms., and on the dressing-floors 250 fms. Then there are the arsenical-works, which, I am sure, you were all highly gratified to see, and which form a great part of our industry. These cover an area of eight acres, and there are on those works seven calciners, three refineries, and 5429 feet of flues, the working capacity of which is 242,461 feet. There is an arsenic mill driven by a steam-engine, spacious stores for arsenic, and staves, coopers' shops, two changing-houses for men, &c. There is a laboratory for all ores going to the arsenic works, and from different parts of the mine in connection with the underground workings. The length of mines from the western part of Wheal Maria to the extreme limits of the sett eastward, through which the explorations have extended, and through which from one end to the other there is uninterrupted communication, is two miles and a-half. Then we have got a large amount of precipitate works, which I hope you have seen to-day, for the extraction of copper held in solution in mineral water pumped from the underground workings, and a number of reservoirs, and a large number of catch pits and sluice settlers for the purification of the water before reaching the Tamar. Then we have a foundry, a carpenter's shop, saw-mill, crushers, hauling machines, dressing machinery, and other requirements throughout the mine. We have two docks and floors, which you have not seen, which are situated at Morewellham, for the purpose of shipping copper ores, arsenic, and for receiving coals, timber, iron, &c. Then we have a length of leats, the main one is 18 ft. wide, and, with other smaller ones, are altogether 8½ miles long The total extent of the mines is three miles east and west on the course of the lodes, and two miles north and south. This is just a little account of the whole thing. We have sold copper ore to the extent of over 3,500,000*l.* sterling up to the present time. We have paid in royalties over 300,000*l.* to the Duke of Bedford, and we have paid 1,200,000*l.* in dividends to the shareholders, and I hope we shall be able to continue that. You may imagine that the conduct of this vast undertaking, from 1844 up to the present time, has caused to the directors the very deepest anxiety, and demands the greatest care and attention from them, and also from the local managers and agents. No one could possibly have the interests of the undertaking at heart more than our present agents. When I came in and consented to take a part in trying to work out this great mine to a successful issue a good many people thought I was going to turn the place upside down. What I have done has been this: I have done my duty to them, and they have done their duty to me; and, so long as they continue to do that I shall look after their interests and the interests of the shareholders. (Cheers.) I have but one object and one aim, and that is to do my duty fairly, honestly, and openly, for the benefit of everyone connected with the mine. (Cheers.) In saying this I think we shall only be doing our duty, and a pleasure to ourselves at the same time, if, in connection with this toast, we drink long life and happiness to our old friend, Capt. Isaac Richards, our manager—(cheers)—and, be it said here, in memory of one who is now dead and gone, that Capt. Richards's brother worked arduously for the benefit of this mine, and did his duty manfully. (Hear, hear.) He died on the mine, and as soon as I had the opportunity of appointing his brother (Capt. Isaac Richards) as manager I did so, and I am happy to say he retains his position, and all the other agents retain their positions, and things have not, in that respect, been turned upside down, as some people said they would be. (Loud cheers.)

The toast was drunk amidst loud cheers.

Capt. Isaac Richards, who was warmly received, responded to the toast. Referring to the future of the mine, he said he believed they would have a good mine for many—very many—years to come.

The Chairman next gave "Success to the Mines in Devonshire," remarking that there were yet good mines to be found in the county, and spoke in favourable terms of South Devon United, recently started. This mine, he believed, would prove a profitable one. He coupled with the toast the name of Mr. Martin, the Chairman of the South Devon United.

Mr. Martin, Chairman of the directors of the South Devon United Mine, referred to the Devon Great Consols, and said he believed nothing could be said in favour of that mine more than it deserved. At the same time he believed there were other mines in the district which meant to do well—not equal, perhaps, to Devon Great Consols, but approaching it. He was connected with the South Devon United, which had been worked for some little time, and he believed it would be one of the best mines, baring Devon Great Consols, in the district. (Cheers.) They must not endeavour to take the palm from Devon Great Consols; there was no such mine in the world, and probably never would be again. Under the management of such a man as they had at the head of the table—a man of great personal experience, of great integrity, and who would not flinch from doing his duty, whatever it might be, but would perform that duty honestly and straightforwardly—he believed the mine they had formally started to-day would prove a success. (Cheers.) Started under the auspices of such men as Mr. Peter Watson and Mr. Moses Bawden, they never need fear the result. In all he had done Mr. Peter Watson had proved himself the right man in the right place, and if he and those who were working with him should fail to make this undertaking a success it would be from no fault of their own, but simply from the chances of fortune. (Cheers.)

The Chairman next gave the "Lords of the Soil," and mentioned that Mr. Willisford, the Duke of Cornwall, and Earl Fortescue, the three landowners, had behaved generously towards the adventurers.

Capt. Clemo, on the part of Mr. Willisford, responded to the toast, and mentioned that that gentleman would do all he could to promote its success, and wished it well in every possible way.

The Chairman proposed the solicitor, which was acknowledged by Mr. G. H. Barber.

Mr. Henry Wilson proposed the directors of Devon Great Consols and Devon Great United. In the course of an able speech he directed attention to the large amount of capital which was invested by Englishmen in foreign mining undertakings, and where, in many cases, it was beyond the protection of British laws, and pointed out how much safer it was in all respects to place capital in legitimate mining undertakings in this country.

The Chairman briefly acknowledged the compliment, and said that the board were doing their very utmost to make Devon Great United a great and early success.

Lord Claude Hamilton, in responding, thanked those present for the way in which the toast had been received. He spoke the feelings of his colleagues and himself in Devon Great Consols and Devon Great United in saying that they had but one object, which was to do their duty faithfully and honestly to those who had been kind enough to place confidence in them, and by united effort, and to the best of their ability endeavour to promote the interests of these two great undertakings. He pointed out that for the most part directors could only look after the accounts and do minor things, but for the scientific work they had men of the greatest experience and highest moral character, who had devoted their lives to the great trade or occupation of mining, so that if the mine did not succeed it would not be from any want of effort, and science and experience being practically devoted to its development. Of course they knew mining was subject to vicissitudes, and, therefore, they must be prepared for any chance; but in the Devon Great United they were not going upon an ordinary speculation as the mine was an old one, and he did not conceive that it would be subjected to those vicissitudes which new and undeveloped mines were subject to, whether here or abroad. From an observation which he heard let drop by a gentleman near him it seemed that some gentleman connected with the mine appeared rather to regret the good old times when protection was given to home industry; but it was no use trying to get back that protection—(Hear, hear)—but they must brace up their energies, and be prepared to meet the exigencies of the times, and he believed they would be able to beat all competition. It was a good stimulus to their energies. He believed no one could beat us upon equal terms, and that we are perfectly safe notwithstanding the foreigner.

Mr. Henry R. Trehern also responded. As one of the directors he thanked them for the compliment they had paid the board, and would only add that he would faithfully do his duty in furthering the early development of the mine.

Mr. York said that as junior member of the board of the Devon Great United it fell to his lot to say a few words in response to the toast. Knowing the men who were engaged in the undertaking, and the great activity which was being shown in getting the mine into profitable work, they would have a valuable and paying property, second only, if not equal to, Devon Great Consols. (Cheers.)

Mr. Stanley Morris also acknowledged the compliment

The Chairman proposed the "Stock Exchange and Mining Market," which was responded to by Mr. St. Alphonse.

Mr. York proposed the "Healths of Mr. and Mrs. Peter Watson." (Loud cheers.) He said that Mr. Peter Watson and his family had been associated with this district for the better part of a century, and had done much good to it. (Hear, hear.) In Devon Great Consols Mr. Peter Watson had come forward at a very critical time, and pulled it through in the way they had seen; and he thought they would all agree with him that whether managing the affairs of a mine, or whether presiding at after dinner proceedings, Mr. Peter Watson was equally at home, and discharged the duties of both positions with pleasure and satisfaction to all around him. (Cheers.) He was sure all present would join most cordially in the toast of "The Health of Mr. and Mrs. Peter Watson."

The toast was drank amidst loud and prolonged cheering, and company upstanding and singing, "For he's a jolly good fellow."

The Chairman acknowledged the toast. He expressed the pleasure he felt in seeing so large a gathering of the shareholders, and expressed the hope that before very long he should be able to announce that satisfactory returns were being made from the mine.

Mr. H. Cattley Stewart, in proposing "Success to the Miners," said that in the inspection of the works which they had just made it was quite clear that great attention and great pains had been bestowed upon the arrangement of the works, and the economical arrangement of each department. (Cheers.) This had been brought about by due attention being given to so arranging all the details that no loophole was left by which any of the real profit of the undertaking could escape; and it must have been a satisfaction to the shareholders to have observed that the directors in their judgment, whilst taking care that a good dividend should be preserved, had not lost sight of one great point—the welfare of the miner; and in many ways had contributed to ameliorate and improve their social condition. (Cheers.) It would be a matter of congratulation to all concerned to know that the question of the social and moral condition of the miner had been fairly attended to, and every weight given to the consideration to which it was honestly and fairly entitled. It should not be forgotten that in and on a mine like that they employed upwards of 800 men, and that probably half that number would be employed in other ways on the works. Therefore, the shareholders were fairly entitled to say that the company might be regarded as a powerful agent for good or evil in the neighbourhood; and he thought that from the way in which the company had identified themselves with the charitable institutions of the district the shareholders could fairly claim to have given attention to the moral welfare of the miners, and were justified in the hope that in future the miner, in his daily work, would consider that in the company he had fair, just, and equitable employers. (Cheers.)

Mr. Moses Bawden proposed "The Strangers," coupling with the toast the name of Capt. Arthur Waters.

Captain Arthur Waters, in acknowledging the toast, expressed his hope and belief that, under the able management of Mr. Peter Watson and his coadjutors, the Devon Great United would prove a success. He earnestly hoped this would be the case, as it would attract further capital to the district for the purpose of developing its great mineral wealth. (Cheers.)

The other toasts were "The Visitors," "The Ladies," and "The Press."

This brought to a conclusion the largest and most successful mining gathering ever held in the county of Devonshire. Mr. Peter Watson and the chief of departments were warmly congratulated on the admirable manner in which everything had passed off.

WHEAL GRENVILLE MINING COMPANY

A general meeting of shareholders of this company was held on Tuesday at the offices, Union-court, Old Broad-street,

Mr. R. W. Goold in the chair.

Mr. R. Mitchell (the secretary) read the notice convening the meeting and the minutes of the last general meeting.

The Chairman said it was a long lane which had no turning, and they might now be said to come to the turning point in connection with this mine. Wheal Grenville four years ago was making a loss of 400*l.* a month, but in the face of that a large expenditure had been made that the mine might be made a dividend-paying one. Six months ago he stated his belief that before the year was out the mine would be placed in the Dividend-Paying List, and he was happy to say that his assertions had been amply and fully justified by the results of the working of the past three months. During the whole of the four years he did not know any occasion upon which it could be said that the mine had gone backwards in its condition, and this was a great thing to be able to say of what might be called a poor mine, if he might use such an expression of what he believed to be a rich property. Though the produce was a little above the average of the whole county of Cornwall it was yet below that of some of the older mines, and there was no reason why it should be very long called a poor mine. Although there had been an average of from 2½ to 2¼ per cent. the whole of the ores had been brought from what might be called shallow levels. They had commenced the levels upon this lode somewhat below 100 fathoms in depth, and were only at present 178 fathoms down, and he believed the ore would turn richer when they got down with the lower levels (the 178 and 190), the latter of which they hoped to reach before the next meeting. They would have learned a great deal from Captain Hodge's report, and it was not necessary to say more than that in their endeavour to develope the mine as speedily as possible the shaft had been sunk during the last three months 5 fms. Six levels were going—four eastward and two westward—one of them being in very good ground worth 14*l.* a fathom, and there was no knowing how soon they might be richer. They would remember that in one run of ground they had a fair run for some 25 fms., the best of which was worth 40*l.* They expected by this time to have got into another rich run of ground, and he did not think it could be far ahead. They had never had anything worth getting until the levels had got away from the shaft; and there were two or three points—one in the 150 and the other in the 165—which might give them better results before they met again. The question would then arise whether with the present appliances they would be able to stamp a larger quantity, or whether they would have to go to some little expense to assist the stamps. They were stamping between 1400 and 1500 tons of tin ore per month, and that was not bad work, considering the nature of the stuff. If they decided to increase the number of stamps by six or eight more there was plenty of room and steam-power, and they might also have to consider whether the purchase of a crusher would be necessary. This latter would cost 250*l.* at the outside, and he believed it would greatly assist the stamps. If during the next six months, whilst they were sinking the shaft to reach the 200 ft. level, and whilst the 178 fm. level was being driven eastward, there was no produce yielding more than 2¼ per cent., they must increase the quantity of poor ore. They must look forward six or nine months before they would be down to the 200 ft. level, but he had no fear that when they had got there they would find stuff increasing in value from 2¼ to 3½ per cent., or more, every mine with the same lode having become richer as they increased in depth. Turning to the figures, they would notice that during the last three months the returns had increased. They had not got beyond 90 tons, but the average of 52*l.* 8*s.* was satisfactory. In the same quarter, in 1879, for 16 weeks the average price obtained for black tin was only 37*l.* 4*s.* per ton. They had now got 52*l.* 8*s.* per ton, which must be a matter of great satisfaction, especially when it was remembered it was above the average of several of the mines. He believed it would be impossible in the face of what had taken place during the past three months for the speculators to "bear" tin down to the prices they were enabled to do during the last three months. In the last quarter the cost of producing tin was for labour 2272*l.* for 83 tons, as compared with 2240*l.*, the average being 25*l.* 9*s.*, against 27*l.* 7*s.*, which spoke as loudly as possible for the great care which their agent had shown in keeping down the expenses, the total average cost per ton for producing the ore being 44*l.* 19*s.* Dolcoath, which was an old mine, had produced 41*l.* 12*s.* per ton, and he thought their mine had done pretty well to do the same for 44*l.* 19*s.* The net profit amounted to 655*l.* 11*s.* 10*d.* They might be asked what they were going to do with this balance, but he should like to say that though the largest slice would come to him, looking to the past history of the mine, and the question of extra appliances, his advice would be not to divide the amount on the present occasion. (Hear, hear.) If they were to divide that amount to-day it would hinder the mine from taking a place it ultimately would as one of the first and best dividend-paying mines in the country. The Chairman concluded by proposing the adoption of the accounts and the agent's report.—Mr. Goodwin seconded the resolution, which was carried *nem con.*

The Chairman next moved—"That the committee be authorised to pay the sum of 274*l.* 11*s.* 11*d.* to the lords' agents, being the balance of claims for dues and damaged land."

Mr. Bumpus seconded the resolution, which was agreed to.

Capt. Hodge, in reply to a question, said the stamps should now do 1500 tons per month, while with eight heads more and a stone-breaker 2000 tons should be done. He believed the lode in the 178 level would be much more productive than the 165, and that the 190 would be better still. He did not for one moment believe the lode would become poorer, but that it would continue to improve.

A cordial vote of thanks was then passed to the committee.

The Chairman acknowledged the same, and moved the thanks of the meeting to Capt. Hodge for his energetic services.

Mr. Earnshaw seconded the resolution, and added that during the few months he had spent in Cornwall he had heard but one expression of good feeling to Capt. Hodge, and the universal testimony that he was a man who never talked clap-trap.—The meeting then separated.

WEST PATELEY BRIDGE LEAD MINES.

The annual meeting of shareholders was held at the offices of the company, Gresham House, on Tuesday,—Mr. Baxter in the chair.

Mr. J. Jameson Truran read the notice convening the meeting, and the minutes of the last meeting, together with the printed reports, which we have already published, were taken as read.

The Chairman: Gentlemen, although I am afraid I cannot congratulate the shareholders much upon the statement of accounts that it is our duty to lay before you to-day, they still show a considerable progress from the preceding year, and in my judgment not by any means such as to encourage any feeling of disappointment; but, on the contrary, they point—and point with very considerable force—to the prosperity of the undertaking, to which we have all been looking forward. We have met with various disappointments in this undertaking, as we do in most mines. I explained to you at the last meeting that our anticipations had not been realised in the lodes that we had intersected at No. 2 shaft, and gave you an account then of the position of the lode in the 56. I also expressed a hope—which was shared in by Capt. Williams—that the wonderfully productive lode in the 56 would hold down to the 67. It was the opinion of all mining authorities who saw it that, having regard to the appearance and strength of the lode, there was every prospect and every reason to form the most sanguine anticipations that it would reach down to the 67. Unfortunately it has not done so. Captain Williams will tell you that it appears to be a "flat," or horizontal lode that we had just intersected in the right position in the 56, where it was very productive, but in the 67 he fears we have got below the ore; and, although we have driven the 67 fm. level from the shaft for 54 fms., and have had a lode with all the matrix that justified our expectations fro n day to day that we were going to cut into ore, the matrix has been a kind of will-o'-the-wisp which has led us on and yet has produced nothing. Therefore, Capt. Williams in his discretion has discontinued driving that lode, but is cross-cutting from it to intersect the Craven Cross vein, and in 2 or 3 fms. more he expects to cut it. If he gets a good lode at that point it will be a most important feature in the history of our mine. It is whole to surface, the old workers having gone nothing like the distance that we have driven now. Therefore, we have great hope in cutting the Craven Cross vein there, which will, of course, very materially alter our position. I must tell you that we have been from the produce of one or two productive points bearing the whole expense of the dead work of the mines; and, although we might have reduced our cost very considerably by suspending some of this dead work, and have shown a profit, we have not thought it a prudent thing in the interests of the mine to do so. In fact, although we have been disappointed in these various points we have considered it the best policy to carry on those explorations and cross-cuts as vigorously as it is possible to do it, and I do hope that we are on the point of being rewarded for the energy and enterprise we have shown in continuing them. The north-east cross-cut, going towards Pately Town, has been driven 57 fms. without sign or trace of lode in any way. Capt. Williams has been driving that with an object he explained to us from the inception of the company—that at a considerable distance from our adit level there were, or were supposed to be, rich lodes, the Lumb, the Rake Vein, and the Cleaver, and at a point at which he has been driving there was a combination of shale and limestone, which is always favourable for a good course of ore. Within the last two or three days Capt. Williams has cut what he believes to be feeders of a lode, and these (pointing to some specimens lying on the table) are the stones that he has brought from the north-east cross-cut met with only a few fathoms from the point at which he always expected to cut the lode. I need not tell you that if he does cut a good lode there what bearing it will have upon our future prosperity. Some shareholders may remember that on a former occasion we showed you a bit that Capt. Williams met with as the first indication of ore in the 56, which was extremely thin, but that lode improved on to the course of ore which has been our mainstay from the commencement, and, therefore, I think that too great importance cannot be attached to this. Of course there is an old saying, that "in mining there is nothing certain but its uncertainty," therefore we may be disappointed, but still there are the best indications that he has come into the neighbourhood of what he considers to be a lode—in all probability a powerful and productive lode. If you find the feeders strong, as these are, the almost certainty is that you will find the lode itself strong and productive. The 56 fathom level, which I repeat has been our mainstay all through, is still productive. It has gone through from the commencement various nips, but hitherto it has invariably opened out again, and continued productive, and has been almost the chief point which has enabled us to carry out all these expensive explorations. I will now refer briefly to the accounts, and afterwards place myself at your disposal to answer any question which you may address to me. You will see that the year's operations have resulted in a loss of 1520*l.*, but in three months of our financial year—July, August, and September of 1879—we only sold 120*l.* worth of lead, but during February, March, April, and May of the present year, we have not only held our own, but shown a small profit of about 150*l.*, and since the date of these accounts we have also fully held our own, even if we have not made a little profit. When that is done, practically from only one point, it cannot be judged to be an unsatisfactory state of things. The price of lead has also been against us during the year under review, for it has been as high as 18*l.* 10*s.*, and as low as 12*l.* 12*s.* 6*d.* Of course if the market had been maintained at anything like the former figure, it would have made a material difference in our accounts. The two main cross-cuts during the whole time the mine has been at work have been an expense of 120*l.* a month.

Mr. Parrick: That would be properly chargeable, if you were not so conservative, against capital account, because you have been capitalising revenue.

The Chairman: That is so. I should have explained it. In most undertakings of this kind, the large bulk of these charges would be against capital. The loss on the year was about 150*l.*, but the the expense of these two cross-cuts will just account for it.

A Shareholder: Had you charged this expenditure against capital your revenue account would show an absolute profit, almost sufficient for dividend.

The Chairman: I hardly think so much as that, but it would at least be a nest egg for a dividend. I wish to impress upon you that we are now approaching a most important point as shown by the leaders that have been cut, and by the 67, being within 2 or 3 fathoms of the Craven Cross lode, both of which points are entirely untouched, and therefore whole to surface.

Mr. Mansell: You have assets 884*l.*, but should not the uncalled amount of 10*s.* upon each share be taken as an asset also?—The Chairman: I do not think so.

Mr. Mansell: I do not ask for my own information, but because some shareholders are under the impression that the end of your capital will be reached when you have exhausted the 800*l.*

The Chairman: We have not hitherto adopted that plan, nor do we think it a correct statement of account to bring the uncalled capital in with the assets, because accounts explain themselves, and any shareholder will see that out of 20,000*l.* there is only 16,032*l.* called up, leaving practically 4000*l.*, that will be at any time available for the operations of the company besides the 200*l.*

Mr. Parrick: Can the manager give us any idea of which lode it is that these "feeders" are approaching?—Capt. Williams: There are some old workings in a property formerly worked, towards which these feeders are going. Now I have taken the bearing of the lode in the shale; the lode may underlie several fathoms to the north. To prove it, we are driving this cross-cut, and never saw any indication of it till last week. First of all we came across a branch of spar, then 2 feet further we cut a second branch, and the importance of this is that if the branches make ore the lode should be rich. Such, at least, is our past experience. As to which lode it is—there is no name given to it. In advance of this, there are some of the most valuable lodes in the district. I saw a plan prepared in the seventeenth century, and on this plan a piece of ground indicated, from which was made 60,000*l.* profit in a few years, simply from the back of one of these lodes in the adjoining sett that we are now likely to strike in our sett. If we do so, it is entirely untouched to surface. The indications are most favourable. This lode traverses the whole of the sett. If we cut a lode there, no man can say what the result will be. We have every appearance just now of being close to a lode, and if it proves only half as productive as the one in the 56 we should have a very valuable mine indeed. It is impossible to say how far we shall have to drive.

A Shareholder: How far distant from us is the Cleaver which made this profit?—Capt. Williams: That is difficult to answer. There is a dislocation between. Taking the bearing of the lode we ought to cut it in about 20 fathoms from the present end. There are other lodes which we may cut. We can trace them in the Pateley Bridge Mine, and they should be intersected in our mine. There is no reason why they should not. I do not like to say they are there until I prove them, but have every reason to expect them.

Mr. Mansell: Will your cross-cut attack any of these lodes?—Captain Williams: It should intersect the four lodes, the whole of which have been productive in the adjoining property. The Pateley Bridge was once divided into 13 companies, and one portion yielded this profit of 60,000*l.* before spoken of.

Mr. Parrick: What is your opinion of the present prospects of the mine? Of course you know there is a diversity of opinion since you have failed to meet any ore in the 67 fm. level.

Capt. Williams: Last year we told you we had intersected the lode, and driven upon it. We said the future prospects depended upon how far it would extend and go down. It had turned out to be a horizontal deposit or "flat," and in that way has disappointed us. We have during the year returned something like 327 tons of ore, although for three months of the year we were not able to make any sales of ore. For the other nine months that will give us an average of 35 tons of ore, which I consider pretty good, but the prospects of our mine now are the cross-cut north-east, which is looking well, and the 56. We shall get the gulf which dislocates every vein in that part of the country, and come in an oblique direction most probably upon the Craven Cross, and a new vein altogether. Should it do so we have every reason to expect to find the lode richer than ever when we have got clear of the influence of the old workings. Whatever we find now will be entirely whole to the surface, both in the old and in the new veins.

Mr. Pearson: On the whole, you consider the prospects are good?—Capt. Williams: I certainly do so. We have had to do everything in the way of machinery and buildings. The first two years were taken up in developments at surface and underground. What we want is a second vein, similar to the Craven Cross vein.

Mr. Mansell: And which you have every expectation of meeting?—Capt. Williams: Yes; I think the further we go west the more valuable will the mine become. The new vein has been our pecuniary salvation. I consider that we have a very valuable property, and that if we cut the lode in the north cross-cut half as rich as the one we have been working on we shall have a very profitable mine. The price of lead has been against us, as the Chairman has said.

Mr. Hammond seconded the motion for the adoption of the report, which was carried unanimously.

The Chairman referred to the sudden death of Col. Todd, whose services as a director of the company had been much missed, for they were very valuable. The directors had appointed in his place Mr. Ernest Harris, of Lloyd's. He then proposed the re-election of Messrs. Hammond and Harris as directors.——Mr Harvey seconded the motion, which was agreed to.

Mr. Mansell proposed, and a Shareholder seconded, the re-election of the auditor (Mr. Carter), which was also agreed to.

Mr. Harvey, in moving a vote of thanks to the Chairman, said that he had explained everything most lucidly. He also wished to couple in the motion Capt. William, the able manager. He was sure they were much indebted to both gentlemen.——Mr. Pearson seconded the motion, which was carried unanimously.

The Chairman returned thanks, and the meeting was then brought to a close.

ISLE OF MAN MINING COMPANY.

The annual general meeting of shareholders was held at the company's offices, Chester, on Sept. 29,

Mr. John Beckwith in the chair.

Mr. R. L. Barker (the secretary) read the notice convening the meeting and the statement of accounts, showing a profit on the year's working of 8258*l.* 7s. 5d., against 127*l.* 7s. in the previous year.

The directors' report remarks that this profit may be deemed a subject for congratulation when we consider that the increased raisings have been greatly neutralised by the diminished percentage of silver in the ore, and the fluctuations in the value of lead. The output has been 3158 tons 2 cwts., as against 2403 tons 3 cwts. for the previous year, and the cost of raising has decreased considerably. This satisfactory result is to be attributed in a great measure to the introduction of the rock-drilling machinery, which has conduced to the more rapid development of the mines and the laying open of bunches of ore, which under the old system could not possibly have been met with for years to come. Though the average price of lead has been greater than during the previous year, the average for our ores is still a poor one, being 13*l.* 5s. 9d. only, as against 12*l.* 18s. 3d.; this in a great measure arises from the bulk of ore raised containing less silver than formerly.

The prosecution of the bottom levels at the Old Foxdale Mine has been again attended with considerable success, and the meeting of the large deposit of ore in the 170 east, which was passed through at the junction of the north and south lodes at the 155, is a source of congratulation, the more so as the vein was found more productive, and the forebreast driving east is still in excellent ore. The western part of the mine has likewise laid open some very valuable ore ground, and our manager, Capt. Kitto, reports that, taken as a whole, the 170 has been richer and more productive than any others since the mine was opened, which speaks well for the 185, at which point the lodes have just been intersected, as also for the development of the mine at a further increased depth. It is likewise satisfactory to know that the increased returns from this mine have been legitimate, and that at no time in the course of its development have the reserves been so large. Increased depth has drawn the attention of the directors and managers to the unsuitableness of the present shafts for the proper and economical working of the mine below its present depth, and they have now under consideration a plan for sinking a new one that will not only take the veins at a greater depth, but will admit of the erection of the most modern machinery for pumping, winding, drawing the men, &c. Townshend's Mine has continued to bear out the promise of eventually proving a valuable adjunct to the company's property, though the delay in cutting into the ore ground at the 110 through the meeting of a poor bar of ground at the point intersected by the cross-cut, has been rather unfortunate, still the ore has now been met with in the west level, and inferring from the drivings at the 95 fair and satisfactory results may not unreasonably be anticipated. The ore raised has been 626 tons 12 cwts., against 443 tons in the previous year.

The directors have paid two interim dividends of 10s. and 5s. respectively on the ordinary shares, and 7½ per cent. on the preference shares. 1000*l.* has been carried to the reserve fund for the redemption of the bond debt, and 1000*l.* has been carried to the new works account, and after wiping off the balance of 2936*l.* 3s. 1d. to the debit of profit and loss account, there remains the sum of 2936*l.* 3s. 4d. to be further disposed of. The directors recommend a dividend at the rate of 4 per cent. per annum, of which 15s. per share has already been paid, and this was unanimously agreed to. The report of Mr. John Taylor, which was of a very encouraging character, was also submitted. Both he and Capt. Kitto appear to have full confidence in the future of the mine. The machinery is in good working order.

WEST WHEAL SETON MINING COMPANY.

A general meeting of shareholders was held at the mine on Oct. 1,

Mr. Thomas Pryor in the chair.

The usual preliminaries having been disposed of, the accounts were submitted, showing a loss on the sixteen weeks working of 490*l.* 9s. 10d., and increasing the debit balance to 1457*l.* 17s.

The Chairman remarked that the accounts were charged up as close as possible, and they would notice that the 58½ tons in stock at last meeting was sold a fortnight after for 372*l.* 7s. more than they credited it for. They now had 35 tons of tin in stock, and seeing the upward tendency of the market they hoped to be able to make a similar profit on it by holding it for a few days. Their arsenic was credited at 498*l.* They had been negociating during the past fortnight for the arsenic in stock, with three or four companies whose price did come up to what he considered sufficient, but that day he and Capt. Rutter had sold it an excess of 50*l.* over the amount credited. West Seton arsenic was considered second to East Pool, but when he told them that they had made more of it than East Pool had made of arsenic during the week he thought they would be agreeably surprised.

The report of Capts. Rutter and Bath detailed the various points of operation. The 140 end west is being driven on the caunter. This lode is letting out considerable quantities of water, and produces occasional stones of rich copper ore. The end is now under New Wheal Seton engine-shaft. Having gone underground in New Wheal Seton a few days since we found the mine to be quite dry as deep as the 60. We think that the extension of the 140 still further west will shortly drain it altogether. When this occurs we purpose to communicate both mines, which would enable us to work New Seton ground more effectually than at present; and this would probably lead to important discoveries of copper ore. There are eleven pitches in work for copper and tin at varying tributes. From the present prospects throughout the mine we anticipate greater returns during the next four months.

Capt. Rutter explained that the falling-off in their returns shown in the accounts resulted from a heavy run in the mine which occurred shortly after last meeting, which temporarily buried one of their most important stopes, and necessitated putting 20 men to work on dead ground. They had now made the place secure, and it was in full working order; and he saw no reason why they should not have as large returns as they had been accustomed to in the past. In New Seton the water was very low, and he was fully convinced that the 140 in Wheal Seton was draining it. If the water continued to decrease as at present he thought New Seton would be dry in a very short time. New Seton was 30 fms. deep; 40,000*l.* had been spent there by the old adventurers, and he believed it would prove to be a very valuable piece of ground to the sett.

Mr. W. H. Rule, in moving the adoption of the accounts and agents' report, said that looking at the management of the mine, and holding such a large interest in it as he did, he was delighted to see the way it was conducted. The purser was not above consulting some of the adventurers as to the sale of tin, and it had, he was glad to say turned out to their advantage. The purser and manager also consulted as to the purchase of materials, and bought in the cheapest market. Referring to New Seton, he said some years ago the adventurers spent 40,000*l.* there, and it was believed at the time that it would turn out one of the richest copper mines in the county. The shares at one time were selling at over 150*l.* each, but the shareholders got disheartened, and the mine was stopped. He thought they would within the next three months drain New Seton Mine, and if they went to the back of the 100 level they would meet with a good discovery in that end. He was confident there was no other such speculation in the county of Cornwall. The price of tin was very much better, and he believed they would see it 100*l.* a ton in a few months. There had been a falling off in the production of tin in Cornwall and Australia during the past twelve months, and, in fact, the quantity produced throughout the world had been considerably reduced, so that he thought a better price must follow. He though they would soon see better times than they had seen for a number of years past.

Capt. Rutter said that the lode of tin in the engine-shaft had apparently no connection with the mineral found to the west of the shaft, but was altogether an independent deposit. Seeing that this shaft sinking under the 190 was the deepest point yet reached, and that the lode instead of showing decay had become of increased value for tin, it afforded them ground for believing that as the older mines of that neighbourhood did many years ago, that mine too was passing through the gates of the belt where tin was formed. All lodes were liable to changes, only with some the changes were much less frequent than with others. They (lodes) became narrow and wide at intervals, and also changed from poverty to riches, and from riches to poverty, repeating themselves, as it were, like the ebbing and flowing of a mineral sea. In all those changes the lode invariably showed indications, which were to the observant miner his guide while digging in the earth. He was not aware of any place where these things had been more magnified than at West Seton. The original adventurers in the mine first sunk on the lode through 60 fms. of barrenness, until at last they came down upon an immense deposit of copper, which made poor men rich and rich men richer. When the shaft again entered into another barren part of the lode, at a very much greater depth, which continued while sinking 40 fms.; but he was pleased to say that the shaft was now sinking in a much richer lode, and that there was strong ground for the assertion that the mine was passing through the gates of that belt where tin was formed.

The Chairman said they had taken power in the notice convening the meeting to make a call, but seeing that the loss was a small one, and that it occurred through an accident, as explained by the manager, he did not think it was absolutely necessary to make a call that day. They would see by the bank-book that they had a balance at the bank, and their accounts were charged very closely, and during the last six months the bank charges were only 30*l.*, so that their financial position was a very healthy one. Tin was likely to be at a better price by the next meeting, and under ordinary circumstances they should more than cover the loss they had made the last four months.

Mr. Rule thought that in the meantime they would make a discovery of copper. The time was when with a small improvement for copper they could return 300 tons a month. He thought they would have a bunch of ore in the end; he did not think they should ever want a call there again, and he hoped the time would soon come when they would have a dividend. Speaking of the management of the mine he said he was satisfied that everything was done that could be done for the benefit of the adventurers. The tin market was closely watched, so that the best price might be obtained for their produce, and this was not only for the benefit of the adventurers, but also for the lord's advantage. He was proud to hear the report about New Seton. It was a very encouraging thing for West Seton, as he believed the time would soon come when they should make a great discovery of copper ore in New Seton. He coupled with the toast the names of the purser, the manager, and agent.

The Chairman said they had done their best for the general body of shareholders ever since they had been connected with the mine, and they had worked together most harmoniously, and everything they could do for the company was being done. It was said that statistics or figures could be used to prove anything, but he had a circular in his hand from a gentleman who was a large metal broker, and had been very much abused lately, Mr. Strauss, but if his figures were correct they were highly satisfactory. They were for the month of September, and they showed a total reduction in stocks of 342 tons. A great and very encouraging point was that the shipments from Australia were only 450 tons, as compared with 1789 tons in August. He had no doubt these figures were correct, and they were very gratifying to them, as miners, in looking forward for the next few months. The figures as to the delivery were also very satisfactory, and as trade improved, with the good harvest they had got, he had no doubt that at the next meeting he would have the pleasure of producing a more satisfactory statement of accounts.

The proceedings terminated with the usual complimentary votes of thanks.

ALAMILLOS COMPANY.

The half-yearly meeting of shareholders was held at the company's offices, Queen-street Place, on Thnrsday,

Mr. J. P. Judd in the chair.

Mr. H. Swaffield (the secretary) read the notice convening the meeting, and the report and accounts (referred to in last week's Journal) were taken as read.

The Chairman said it was with great pleasure that the directors met the shareholders that day, as the accounts were satisfactory, both from a mining and financial point of view. They had realised a profit of 2051*l.*, which compared very favourably with the previous accounts, although lead during the greater part of the six months had been only about 15*l.* per ton instead of the normal price of 20*l.*, and as they sold about 1200 tons the difference would have given them 6000*l.* additional profit. He quite endorsed all that Mr. Taylor had said as to the management of all these companies, and he could not lose the opportunity of referring to the efficiency of their secretary, Mr. Swaffield; his attention was indefatigable, and every question put to him was readily answered. Their financial statements were all drawn up, and made as clear as possible by Mr. Swaffield, and were in every way satisfactory. He would at once call on Mr. Tonkin to give them some particulars of the mine, and would conclude by moving the reception and adoption of the reports and accounts.

Mr. Wylde enquired whether the mines were really in a better position than they had been for several years?——Mr. C. Tonkin, the superintendent of the company in Spain, said they were all aware that they had extensive property, some 2¼ miles long, but the length of the veins was much greater than that as, in many cases they had four parallel lodes, although not for the entire distance. For some time past they had had a good lode, worth 5 tons per fathom in the 70 fathom level. The bottom level, he would mention, was also turning out well. On the whole, the mine was looking better than for two or three years. They had adopted recently a plan of setting on more tributers. They work on their own system, and sometimes got 100 tons per month, and at the same time proved ground and discovered lodes, which could afterwards be turned to account by the company. He had no fear of the continuity of the mine, which was not so good as Linares, but as the lode made rich in parts it yielded good returns. The lode rather improves in depth, the 115 being better than the 100. At San Victor the 70 is better than the 60. He considered the prospects very good indeed; the mine is in good order, the machinery good, and they have about 150 men employed underground.

A Shareholder enquired whether they were still purchasing ores?

Mr. R. Taylor said that during this year there had been such a keen competition for ores in Linares that they had not bid, and he could only suppose, knowing the movements that had taken place in the price of lead, that the purchasers had made a loss.

Mr. J. Taylor thought the remarkable feature is the great length of the property. They had not hitherto had the money to make a variety of trials, which are worth making, but they would ultimately extend the levels eastward, and he believed that eventually they would have good discoveries in ground now dormant. In the western ground they had already had good discoveries. He had always had the greatest confidence in the mine; he held a large number of shares himself, and Mr. Tonkin held still more largely. They were now able to raise enough lead to give a profit even at the present low price, so that with ordinary prices he did not doubt that they would obtain profits that would satisfy them all.

The usual complimentary votes of thanks terminated the proceedings.

THE LINARES LEAD MINING COMPANY.

The half-yearly general meeting of shareholders was held at the company's offices, Queen-street Place, on Thursday,

Mr. W. Cox in the chair.

Mr. H. Swaffield (the secretary) read the notice convening the meeting, and the reports and accounts referred to in last week's Journal were taken as read.

The Chairman said that in submitting the resolution that the report and accounts be received and adopted he would make but few observations, as they had their representative in Spain present, who would give them details of the mine and its prospects. He congratulated them on their financial position. They had just paid a dividend of 8s. per share, the second this year, and had sufficient cash in hand for another of the same amount if the accounts for the current half-year showed that they were justified in declaring it. With regard to the permanence of the mine, he might tell them that since 1877 they had doubled their reserves of ore. He then formally moved the resolution.——Mr. Sheldon seconded it.

Mr. C. Tonkin, the superintendent in Spain, was glad to have an opportunity of explaining a little as to the continuance of the concern. They had been going on for several years making a small profit and adding to the reserves, and he thought there was a probability of the same course being followed for some time to come. In the 100 fm. level in Warne's part of the mine the ore ground had continued east further than in the level above, and in the 115, which they were now driving under the 100, the appearance was also improving. If the continuation of ore was met with eastward there would be reason to believe it would reach up to the old Pozo Ancho. The lode at Peill's Mine is compact and regular, which leads them to believe that it would continue valuable. The San Jose, the deepest mine in the district, justifies this opinion. Altogether their prospects at Linares were very good indeed, and he thought they would increase their reserves this half-year. At the old mine it will be easy to sink San Tomas shaft if the improvement eastward continued and they could use flat rods to work it. Quinientos has not turned out as was at first anticipated, but in the 80 over the present level they had some good mineral, which they would soon be under.

Mr. Taylor thought it only right to say as to the financial business they were much indebted to Mr. Cox; and, as to their general affairs, he would boldly state that there was no company in London which was better managed, or with more regularity and system, than these Spanish mines. The duty of himself and his brother was much lightened by the assistance they received from the board, and he thought the shareholders might be congratulated that they had been able to secure profits even in these bad times. They had money in hand, owed nothing, and were gradually obtaining reserve funds. They were, moreover, increasing their returns, and had a set of mines second to none with which they were acquainted. He concluded by congratulating the shareholders upon their position and prospects.

Upon the proposition of Mr. Balfour, seconded by Mr. Crosby, thanks were voted to the Chairman and directors, in acknowledging which the Chairman said that they appreciated the vote the more because they knew they deserved it. As to the finances, which had come particularly under his cognizance, he might mention that ten years ago they were in a position which gave him some anxiety, owing to their having frequently to force the sale of their lead to meet engagements; but at present they were always able not only to meet engagements, but to do so without selling 1 ton of lead at a price which they considered was too low.

Upon the proposition of Mr. Donagan, seconded by Mr. Wylde, thanks were voted to Mr. Tonkin, the superintendent, and the other managers at the mines, in replying to which Mr. Tonkin said he was glad to have an opportunity of returning thanks for the kindness. He could assure them that they had an able staff of agents at the mine, all industrious, temperate men, and well acquainted with the work. They were all intensely interested in doing their best for the shareholders, and this vote would further encourage them.

The proceedings then terminated.

FORTUNA COMPANY.

The half-yearly general meeting of shareholders was held at the company's offices, Queen-street Place, on Thursday,

Mr. R. Henty in the chair.

Mr. H. Swaffield (the secretary) read the notice convening the meeting, and the reports and accounts, already referred to, were taken as read.

The Chairman said that the presence of their superintendent in Spain rendered it superfluous for him to make any observations, but he must say that there was no ground for despondency because the dividend had slightly fallen off this half-year. They had had heavy charges, which, as was indeed always the case, had come at an inconvenient time. As to the old story of low price of produce, it was unnecessary to go into the question, as they all well knew that when prices were low they could not earn the same profits as when they were high. They would have to ask authority to withdraw a certain amount of money from the reserve fund for their new purchases, and by considering the resolution before they heard Mr. Tonkin, it would prevent their having to go over the same ground twice. He concluded by formally moving that the reports and accounts be received and adopted.——Mr. Sheldon seconded the resolution, and it was carried unanimously.

The Chairman said that the next resolution would be as to the withdrawal of 1000*l.* from the reserve fund. San Anton had been successful, and even more so than they expected; it had yielded and continued to yield good quantities of ores—enough to nearly cover cost, which was unusual at the beginning of mining operations, in connection with which they had often to live on hopes and expectations for a long time before they obtained profits. Their cost would be about 270*l.* per month for the next six months, or about 60*l.* per month more than the returns, so that with the proposed expenditure at Clarin Mine there would be about 1250*l.* to provide. They had some money in hand, but to carry on those operations the directors wished sanction for the withdrawal of 1000*l.* from the reserve fund, and if they could thus increase their returns it would be most desirable. He concluded by formally moving the resolution.——Mr. Balfour seconded the motion.

Mr. Wylde enquired how it was that on the credit side of the balance-sheet there were three items of investments in Consols in different places?

The Secretary explained that the company were really possessed of about 4000*l.* Consols. The item under reserve fund investment account, 1542*l.* 8s. 8d., belonged to the reserve fund; the item under the new mines investment funds was not an actual investment, but was the amount sanctioned to be withdrawn from the reserve fund, which had been partly expended, although the stock had not been sold out; and the 1383*l.* 6s. 6d. which was placed among the assets was floating capital. When the 1000*l.* now under consideration was authorised to be withdrawn there would be about 1300*l.* reserve fund balance.

The Rev. Mr. Hurst considered this expenditure of 1000*l.* was very judicious, as without capital there, of course, could be no profits.

The resolution was then unanimously agreed to, and the Chairman called on Mr. Tonkin for an account of their new acquisition.

Mr. Tonkin congratulated the shareholders on the possession of a very valuable property in the new purchase, but the old mine was not done yet by a long way. Even the Canada Incosa was paying its way, although not like Los Salidos. Don Pedro lode, which was a caunter to the main, was also opening out well. In the old mine they had a considerable length of ground, which they were working at two points by using flat-rods. As to Los Salidos, it was scarcely necessary to mention it, as the mine spoke for itself. They had had for three years a deposit near Cox's shaft which had given them 3 tons per fathom, and the cost of driving it was 8*l.* per fathom. They were now coming under that deposit with the level below, and as the ore appeared to be dipping east it was very gratifying, as, if so, Los Salidos would reach up to Graciosa. The 160 and 175 were turning out better than the levels above, and they hoped to keep on equally well for some time; in fact, he thought none of them would live to see the end of it. San Anton they bought for a mere song, and it was now worth a good deal of money; he believed that all the ground was worth 2 tons per fathom. The shaft on the lode as at present was rather a disadvantage, as the ground is usually weaker. The mine could now if really necessary be made self-supporting. They had sunk the shaft 15 fathoms, and they would not now listen to an offer of 15,000*l.* [The Secretary remarked that it cost 800*l.*] It could be made self-supporting, but that would not be the proper way to open out the mine for permanence. They had another mine further east which had 22,000*l.* expended upon it, but owing to the water and inefficient management they left it with ore in it, of which they would reap the benefit. He gave the tributers on the parallel lode 100*l.* to give up their bargain, so that they had now full control. By using up the fund now provided he estimated that in 12 or 18 months they would bring the mine into working order. The company's mines were continually improving.

Mr. Wylde enquired what had been done with reference to the railway to which allusion had been made on former occasions?——Mr. Taylor said it was a branch line into their works at Cordova, which would make a difference to the company of 700*l.* per annum in carriage.

Mr. Tonkin added that it would also save 500*l.* per annum in loss of lead.

Mr. Cox said that the seventh clause of the contract was one which the company could never agree to, as it would compel the company to send all the ore over the railway company's line to Malaga.

Mr. Tonkin explained that it would only bind the company to send the ore over the branch. The companies were to do the earthwork for the line, and the railway company would then put down the permanent way.

Upon the proposition of the Rev. Mr. Hurst, seconded by Mr. Crosby, thanks were voted to the Chairman and directors; and, on the proposition of Mr. Balfour, seconded by Mr. Donagan, thanks were also voted to Mr. H. Swaffield, the secretary, and the other officials.

Mr. Swaffield, in acknowledging the compliment, said he was well seconded by the clerks, and must especially mention Mr. John Garland, who is the accountant, and does his work admirably.—The proceedings then terminated.

BAILEN COMPANY.

The ordinary general meeting of shareholders was held at the company's offices, Queen-street Place, on Thursday,

Mr. W. Cox in the chair.

Mr. H. Swaffield, the secretary, read the notice convening the meeting, and the reports and statement of accounts were taken as read

The Chairman, in moving the reception and adoption of the reports and accounts, said that they had been much disappointed with the mine. They had spent much money, and had been overwhelmed with engineering difficulties, but they were now beginning to work the mine. They came almost to a winding up, but just escaped when they drove on the lode and found it worth 2 tons per fathom; they had no sooner done so than they had a breakage, and the water came in; but the lode which they had seen just gave them encouragement to go on. They got 2763 more shares taken up, which provided them with the necessary additional capital, and they had now about 3000*l.* left. They were at present really at work at the mine, for Mr. Tonkin would tell them, from a letter he had received that morning, that they were now doing some mining operations.

Mr. Tonkin said he must supplement the Chairman's remarks as to the great quantity of water and the engineering difficulties met with by saying that they had met with innumerable obstacles or disgustos, as they called them, but they had now a 30-in. Cornish engine which had been at work for three months and was working well. He believed that as they kept on working the water would diminish, They had contracted to put down 20 metres (11 fms.) in four months. They had now cut some ore at the 30, but this was accompanied with extra water, which again brought the engine up to 13 strokes per minute. A short cross-cut from the shaft would intersect the lode, where they hoped it would be found productive. At the 30, both east and west, they had good stones of ore, which was a good indication, and he thought it would give satisfactory results. He would encourage them to go on with the work. In 26 metres they would get to the 45 fathom level. By this time eight months they would be down to that depth, so that in eight or nine months they hoped to met with the lode. The engineering difficulties are all overcome.

The Chairman enquired whether the strata were the same as at La Virgen and El Correo?—Capt. Tonkin said they were, and in reply to further enquiry said it was reported that in those mines the lode was poor at the 30, but from the 45 downward it was rich.

Mr. R. Taylor said that the great inducement to them in taking up the mine was the great richness of La Virgin and El Correo, and that the geological formation was the same as in those mines. The cause of disappointment could not at all have been anticipated, as in that district heavy water was almost unknown. The machinery put up was quite such as should have been sufficient, judging from the experience of other mines in the district. The erection of the 30-inch engine had, however, now been effected, and it must have been a great satisfaction to the shareholders to hear from Mr. Tonkin that all difficulties had been overcome. He hoped that they had a chance of meeting with something good at the next level.

Upon the proposition of Mr. Austin, seconded by Mr. Donagan, the retiring directors- Messrs. Cox and Abercrombie—were re-elected; and upon the proposition of the Chairman, seconded by Mr. J. P. Judd, the auditor—Mr. J. W. Jepps—was also reappointed.

The usual complimentary votes terminated the proceedings.

[For remainder of Meetings, see to-day's Journal.]

Signalling from a Cage.—Particulars of an ingenious invention by Mr. Charles Cummings, of Virginia City, Nevada State, have just reached me from a friend of mine in that locality, and as I think they will be of interest to persons connected with Cornish mining I will give them here. The invention is an apparatus for signalling from a cage when it is being lowered down the shaft. No matter how rapidly the cage may be running those on board of it are able to instantly signal the engineer on duty from any point of the shaft. The apparatus is exceedingly simple. There is no machinery to get out of order. No wires are used, but instead two strips of sheet copper, about an inch apart, run down the shaft alongside one of the guides, and whenever connection is made between these two strips of copper a whistle, placed just beside the engineer, is blown. Attached to the cage is a brush of fine copper wire made in the form of a half-circle, or eccentric, which is turned by means of a crank. Every turn of the crank of this wheel opens and closes the circuit making one blast on the whistle. By turning the crank regularly any desired number of short blasts may be sounded on the whistle, or by holding the brush side of the wheel upon the copper strips a long continuous blast may be blown on the whistle. Thus, dots and dashes or the regular Morse signals may be made if desirable. A miner may make the signals with his lantern, candlestick, or with any bit of metal he may have in his hand or can reach. However, the brush is always on hand, in place, and ready for use. The beauty of the invention is its great simplicity. There is nothing to get out of order, nothing to in any way cause failure in the sounding of the signals. All that is necessary is to keep the batteries in order. There are no wires to be broken or to become crossed or entangled in any way or by any accident. Nothing but a general ripping up of the timbers of the shaft can interfere with the action and utility of the apparatus. Mr. Cummings has patented his process in Europe and America.

— Paul Miner: *Western Daily Mercury.*

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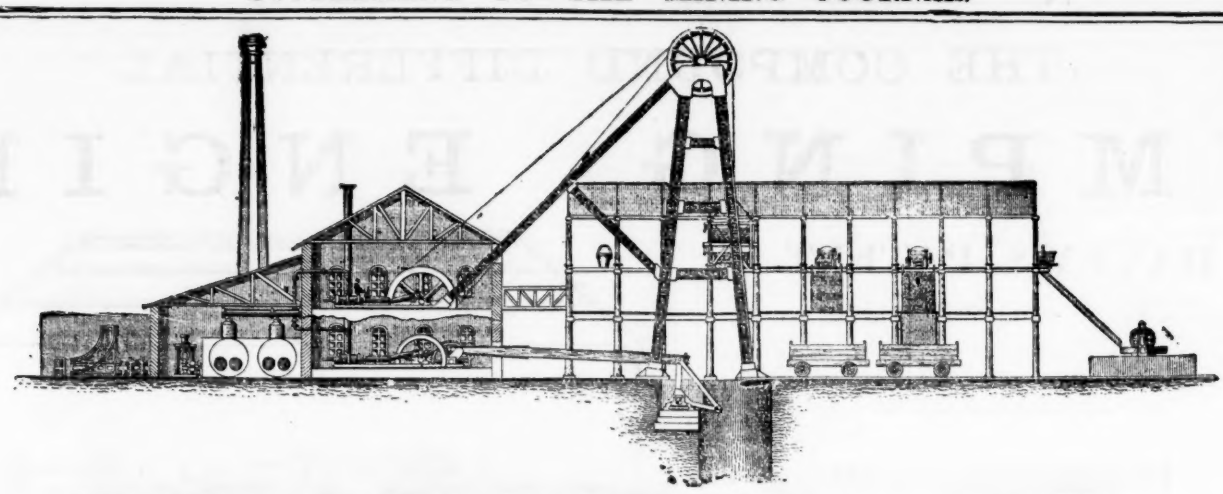

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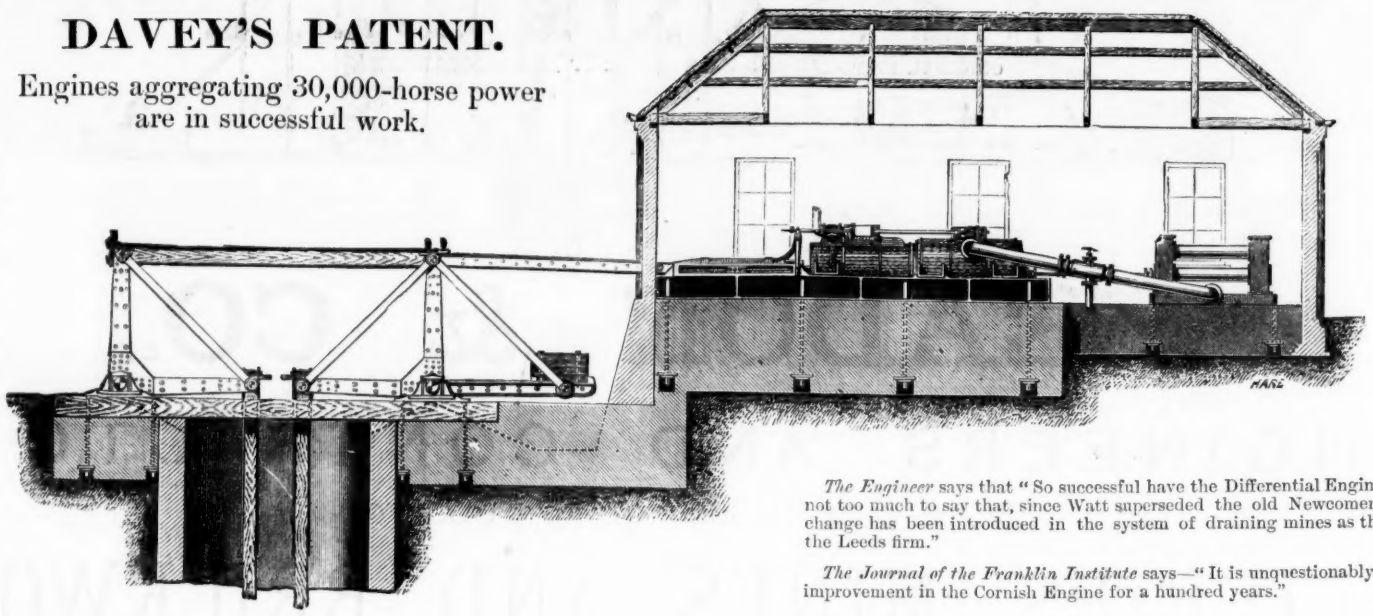

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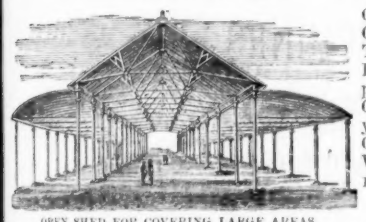

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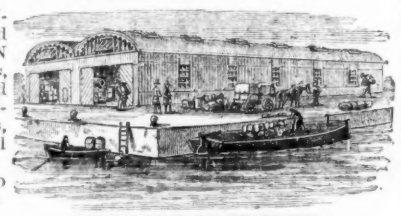

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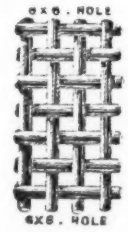

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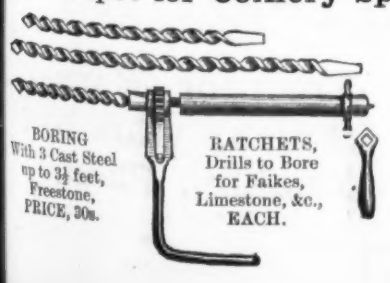

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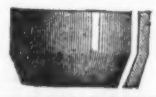

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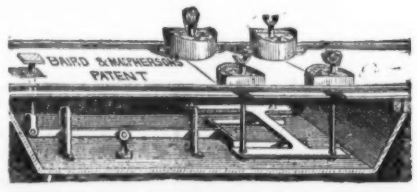

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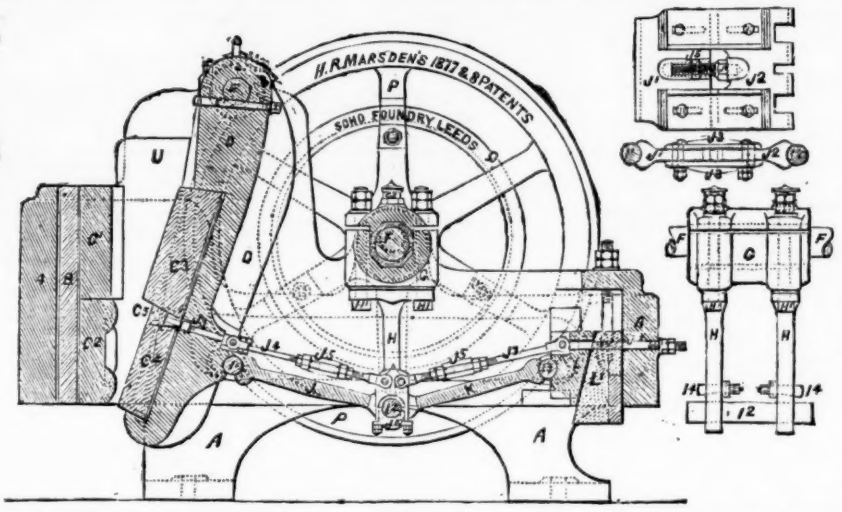

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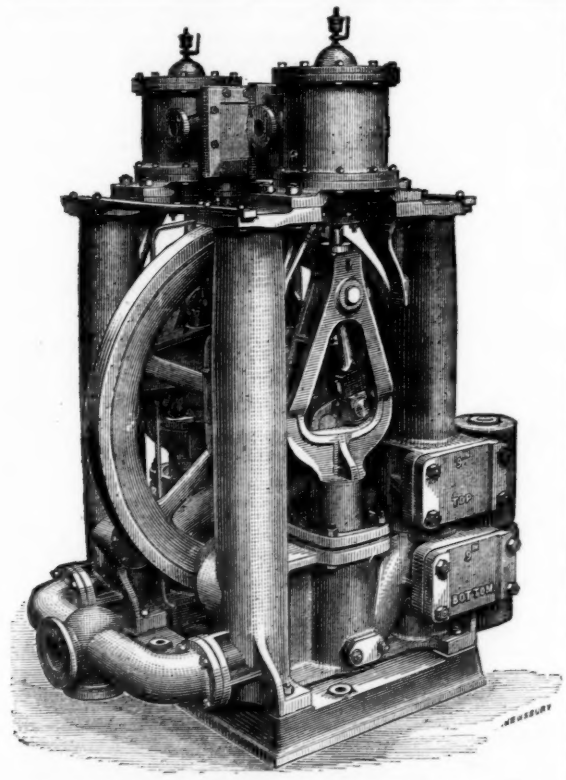

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